The Citrus Industry
EXCLUSIVE SPECIALIZED CITRUS PUBLICATION
Issued Monthly
Representative of every interest
Representing no special interest

Vol. 9 TAMPA, FLORIDA, DECEMBER, 1928 No. 12

Mottle-Leaf, Marl Chlorosis, Nitrogen Starvation, Three Forms of Chlorosis on Citrus Trees

By Dr. Arthur S. Rhoads, Associate Plant Pathologist, Cocoa Laboratory of the Florida Agricultural Experiment Station

Chlorosis is a general term applied to that abnormal condition of plants in which the parts either fail to develop, or lose after they develop, the green color characteristic of normal plants and become greenish yellow to yellow or almost white. Anything which prevents or retards the formation of the green pigment (chlorophyll) normally occurring in plants interferes with their normal functioning, affects directly the carbohydrate food supply and results in a weakened, diseased condition.

Chlorosis of plants may be of two general types, namely, non-infectious and infectious. Non-infectious chlorosis may result from unfavorable environmental factors, unbalanced nutrition and starvation, in which case the derangement is temporary and disappears with the elimination of the inciting factors, or it may be inherent in the stock and be reproduced by the seed or only by cuttings, buds or grafts. When genuine chlorosis appears in food plants it is considered to be a detrimental or diseased condition since the photosynthetic power of the plant is reduced or modified in accordance with the intensity of the yellowing. When, however, chlorosis of the type termed variegation appears in ornamental plants it is considered as adding to their decorative value and effort is made to preserve the variegated forms. Infectious types of chlorosis may be transmitted to healthy plants by buds, grafts or by inoculation with bits of tissue or juice from the affected plants. So far as is known, however, all forms of chlorosis on Citrus trees are non-infectious.

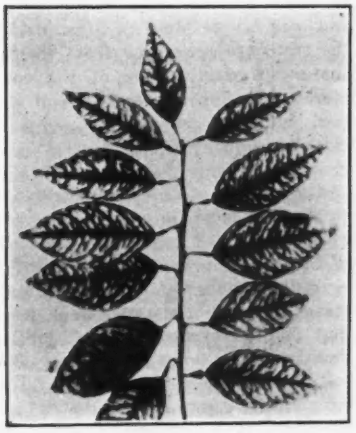


Fig. 1.—Mottle-leaf or frenched condition of orange foliage.

A number of different forms of chlorosis occur, some of which have been given specific names. This article will be limited to a discussion of the three forms which are of greatest importance to the Citrus grower, namely, mottle-leaf or frenching, marl chlorosis and nitrogen starvation.

Mottle-Leaf or Frenching

Mottle-leaf, or frenching as this trouble is frequently termed in Florida, is a condition of partial chlorosis of Citrus trees that is of widespread occurrence thruout the Citrus-growing sections of Florida and appears to be present in varying degrees in all countries where Citrus is grown. In Florida, mottle-leaf is of by far the most frequent occurrence on the lighter and more droughty types of sandy soils and occurs much more commonly on oranges and tangeries than on grapefruit. The amount of injury caused by this trouble is extremely variable. In mild cases, it may affect merely the foliage of a

few twigs or branches on occasional trees and the condition may disappear eventually without any corrective measures or particular change in the method of handling the grove. In severe cases, on the other hand, the trouble may be quite persistent and the greater part of the foliage may be affected to such an extent as to interfere seriously with the growth of the tree and the production of fruit. Trees greatly weakened from aggravated cases of mottle-leaf may be attacked readily by the withertip fungus. Mottle-leaf may also occur in connection with exanthema, altho it has no direct connection with this disease, as is often believed by growers. It is rarely found generally distributed thruout any one grove unless the grove has been limed, root-pruned by deep plowing or deep cultivation, or otherwise grossly mismanaged.

Symptoms

The symptoms of mottle-leaf usually are confined to the leaves and the twigs upon which they are borne. Affected leaves develop with pallid to conspicuously yellowed or chlorotic areas between the main veins on either side of the midrib, the balance of the leaf becoming green. This results in an irregular mottling or variegation of the foliage (fig. 1). Mottle-leaf is a case of non-development, or of retarded development, of the chlorophyll, or green coloring matter, that characterizes normal leaves. The mottle-leaf condition makes its appearance with the development of the leaves and leaves that have once developd with normal green color do not become mottled. The variations in color become more definitely marked as the leaves expand.

The yellowed areas on any one leaf may vary from small, irregular spots, in mild cases, to extreme cases of yellowing in which the normal green color is developed only immediately along the midrib and the main lateral veins. The worst mottled leaves occur towards the ends of the shoots. In trees only slightly affected, the mottle-leaf condition may occur on leaves of normal size and without much effect on the tree. As the trouble increases in severity, however, the leaves mature smaller in size and, in chronic cases, they not only remain very small but are very narrow and pointed in comparison with healthy leaves. Portions of the tree, or even the whole tree, may become densely branched and stunted, with the twigs dying back from the tips. Following this repeated dying back of the tips, multiple buds appear, as in exanthema, and a witches'-broom type of growth results. In these extreme cases of mottle-leaf, much of the fruit is very small and colors and drops prematurely.

Cause

Mottle-leaf has provoked much discussion among growers, pathologists, physiologists and chemists. As a result of a number of investigations at different times and in different places, several rather diverse theories have been advanced to explain the cause of this obscure trouble.

The factors contributing indirectly to the development of mottle-leaf appear to be many and varied. Probably the most constant condition with which this trouble is associated in Florida is a deficiency of organic matter and moisture in many of the soils devoted to Citrus culture and the tendency for growers to rely solely upon commercial fertilizers to supply the requirements of the trees. In soils deficient in organic matter and subject to deficits of moisture the trees are prevented from making the most effective use of the commercial fertilizers applied and the low biological activity of such soils is often unfavorable for a good growth of Citrus trees. Deep plowing and deep and unnecessarily frequent cultivation have long been recognized as important contributing factors to the development of mottle-leaf. It is quite evident from the former craze to apply lime to Citrus trees that liberal applications of ground limestone or other form of lime commonly bring on a severe outbreak of mottle-leaf, especially on the lighter, droughty types of sandy soils deficient in organic matter, from which it may take years for the trees to recover. This trouble commonly occurs after freezes, periods of drought and severe pruning and dehorning of trees. Its occurrence in Florida is attributed also to poor drainage and, irregular supply of food and moisture, and severe infestation of the roots with nematodes. Evidence obtained in California and the Phillippine Islands shows that certain varieties of rootstocks, scions, or combinations of the two, are conducive to the development of this trouble.

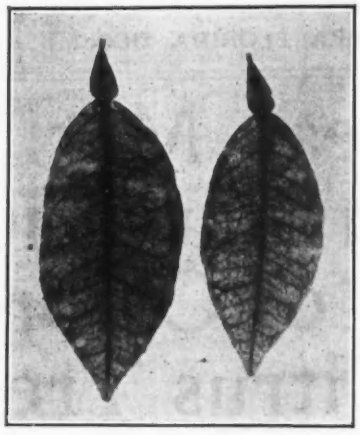


Fig. 2.—Grapefruit leaves showing marl chlorosis.

From the various investigations that have been conducted thus far, it is evident that probably none of these conditions acting alone would necessarily produce the disease but only when they influence the nutrition of the tree in such a way as to prevent it from satisfying its requirements. The exact cause appears to lie in the complex question of the role of certain mineral elements in life processes of the tree and is far less understood than the conditions that contribute to the development of the mottle-leaf condition.

According to investigations conducted in California, where mottle-leaf has been studied most extensively, it is a nutritional deficiency probably related in some way to the inability of the tree to satisfy its calcium requirements. These investigations have shown that Citrus trees require for their normal growth a large amount of calcium and that whatever conditions within or outside the tree tend to prevent sufficient calcium from getting to the leaves, probably contribute indirectly to the development of mottle-leaf. Kelley and Cummins, in 1920, found that mottled Citrus leaves are low in calcium as compared to normal leaves. Reed and Haas, in 1924, have shown that symptoms closely resembling mottle-leaf may be induced by controlled nutrient conditions where calcium is insufficiently applied to young trees in tanks, especially when potassium or a similarly acting chemical base is unduly large in comparison with the amount of calcium and that, in such cases, a condition is brought about which appears to be favorable to the development of mottle-leaf. On the other hand, Valleau and Johnson, in 1927, on the basis of their work with frenching of tobacco, attribute mottle-leaf of Citrus to a deficiency of nitrogen.

Since then, Haas, Batchelor and Thomas, in California, have shown that rosette of pecan, yellows or little-leaf of walnut and mottling of apricot are closely related to mottle-leaf of Citrus and may be brought on by the same environmental conditions that induce the development of the latter trouble. The respective troubles of these kinds of trees developed when the trees were planted in a block of Citrus trees badly af-

fected with mottle-leaf but none of these troubles occurred when trees of the same lot were planted in soil in which Citrus trees were free from mottle-leaf. They consider that these diseases are independnt of the nitrogen content of the soil and call attention to the influence of the phenomenon of the exchange of chemical bases in the soil upon the nutrition of the trees.

While it might be supposed that the remedy for mottled-leaf would consist simply in the addition of certain calcium (lime) compounds to the soil, it is evident that such procedure would be beneficial to Citrus trees only in soils actually deficient in calcium and which are at the same time strongly acid in reaction, providing the substance added does not result in excessive alkalinity. It is contended by the California investigators that the addition of any substance which tends to make the soil reaction more alkaline, would, at the same time, decrease the availability of calcium. This explains why applications of ground limestone to light, sandy soils in Florida have resulted in the development of severe cases of mottle-leaf.

The remedy for mottle-leaf would then appear to lie in the employment of practices that tend to neutralize the alkaline reaction of the soil so that the calcium already present or which may be added later may become available. Therefore, only substances resulting in greater acidity rather than greater alkalinity are recommended where mottle-leaf occurs on the lighter, sandy soils. While the majority of the Citrus soils in California appear to range from neutral to alkaline in reaction, most of those in Florida, with the exception of the low hammock with marly subsoils, appear to range from neutral to acid in reaction, altho there is some evidence to show that exceptions occur, especially in the case of mottle-leaf.

Control

No specific method can be recommended for the control of mottle-leaf since this trouble may be favored in its development by many different factors. It is quite evident, under average Florida conditions, that deficiencies of moisture and organic matter and the low biological activities in the lighter sandy soils are extremely important factors in limiting, or even curtailing, the availability of certain essential elements required by Citrus trees and that this limitation commonly operates through an unbalanced soil condition, the effect of which may be aggravated by certain fertilization and cultural practices. It is highly important to discontinue or modify any cultural practices, especially deep plowing or cultivation and depletion of the organic matter, that induce the development of mottle-leaf.

According to recent California investigations, the remedy for mottle-leaf appears to lie in the employment of practices that tend to obviate an unbalanced condition in the soil, particularly any tendency to increasing the alkalinity of the soil, which would, at the same time, tend to decrease the availability of calcium. Only substances or practices resulting in greater acidity rather than greater alkalinity should therefore be used on soils where mottle-leaf is liable to develop. For this reason, the addition of stable manure, bulky organic matter and cover crops are beneficial on many such soils because the processes of fermentation and decay set up tend to increase acidity and consequently tend to increase the availability of calcium. Since it is only in subsequent growth that normal leaves can again be obtained, it is necessary that the tree have sufficient nitrogen for the production of new growth.

Stable manure is especially valuable as a means of renewing and stimulating the bacterial activity in soils that have become more or less "dead". Applications of either sulphate of ammonia or sulphur to the soil should prove helpful in increasing soil acidity and the availability of certain essential elements which, altho present, may be locked up so that they can not be utilized by the tree.

Marl Chlorosis

Marl chlorosis is a characteristic form of chlorosis that is of widespread occurrence in Florida in groves underlaid by marl or other calcareous formation. A somewhat similar form of chlorosis may also occur at times on soils not underlaid by marl. Wherever a pronounced chlorosis of this type occurs, however, there usually is a high percentage of calcium carbonate in the soil, which is indicated by the effervescence produced when acid is applied to the soil.

Symptoms

In this type of chlorosis, a partial or more or less complete pallid green or yellow color develops rather uniformly over the entire leaf, the midrib and other prominent veins alone remaining green for a time so that their outline is plainly traceable over the surface of the leaf (fig. 2). In the less advanced stages, the groundwork of the leaves remains a very pallid green but in longstanding cases it becomes more yellow and eventually even the veins lose their green color. In severely affected trees the leaves are abnormally small and narrow, as in mottle-leaf, and many of the leaves may drop from the terminal twigs, leaving them more or less defoliated but remaining green for a time. The trees become more seriously affected with increasing age, eventually becoming unproductive and dying back.

In many groves where this type of chlorosis occurs in Florida a layer of marl often occurs within from a few inches to a foot or two of the

Continued on page 28

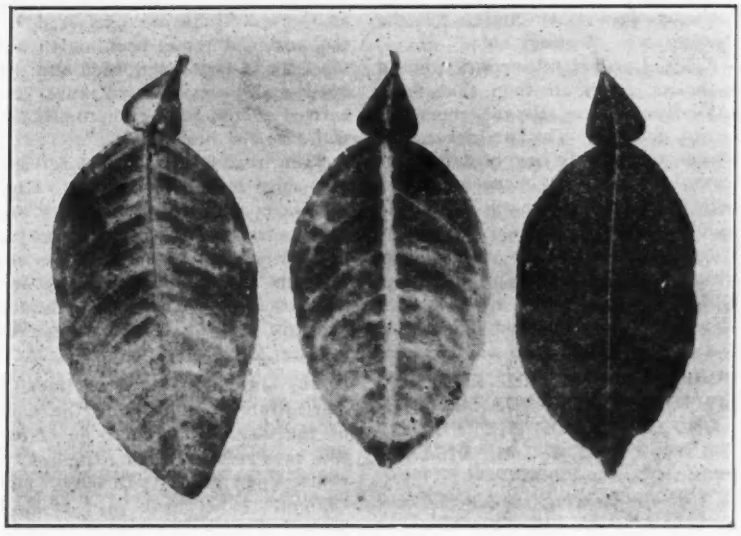


Fig. 3.—Grapefruit leaves showing chlorosis resulting from nitrogen starvation. A normal leaf is shown at the left for comparison.

South Has Opportunity In Export Fruits and Vegetables

Possibilities of developing an export trade in Southern fruits and vegetables by direct shipment to European markets from Southern ports were outlined by Wells A. Sherman of the Bureau of Agricultural Economics, United tates Department of Agriculture, addressing the Southeastern Foreign Trade Conference at Atlanta, Georgia, November 21.

"There is increasing foreign demand for high-quality oranges. Many thousands of bushels of American peaches properly packed and shipped may be sold in Great Britain. Lettuce and celery may be marketed abroad successfully. The British market may furnish an outlet for the smaller sizes of pecan nuts."

Florida grapefruit arrives abroad in better condition than that from any other source, Mr. Sherman declared, but any "further increase in its consumption is largely dependent upon its price to the consumer. Direct shipments from ports in Florida should help in this direction. If the fruit can be retailed at 3d. each, which means an auction price of from $2.43 to $2.92 per box of sizes 80's, 96's, and 112's, there are good possibilities of volume consumption. The fruit must be sold in Europe at prices within the reach of working men.

"Florida has possibilities early in the season of developing an export trade in oranges. It is possible that demand for this fruit might continue during the winter, on a limited scale, based upon the reputation of Florida oranges made during December and early January. This development depends upon shipping fruit uniformly of high quality. Quality oranges must be shipped in the popular sizes from 150's to 225's. Yellow-fleshed peaches will sell even though such varieties as Georgia Belle are preferred, but the principal requirement is to land the fruit in sound condition and with good eating qualities. Mature fruit carried at low temperatures probably will give the best results.

"The institution of direct refrigerator ships from Jacksonville to Great Britain opens up the possibility of a celery trade, not possible in past years when it was necessary to ship through the port of New York. It is suggested that trial shipments be made to responsible British commission merchants so as to determine which packages are the most satisfactory for this business and to give the British trade a demonstration of the character of celery grown in Florida.

"If the Southeast shipped as good quality lettuce as is produced there, it might be relatively easy to establish at least a limited trade at very satisfactory prices in a market where our goods would be the best on sale. The situation warrants the trial of lettuce shipments in direct ships during the months of January, February and March. It may be found desirable to experiment with shipments having the roots attached, as it is possible this might result in less wilting than would be incident to shipments of lettuce cut in the usual way.

"Pecans are little known in Great Britain and any extension in their use would require concerted effort among producers to familiarize the trade as well as European consumers with this product. It is probable that the pecan will make its way slowly in that market and can be sold there in large quantities only at relatively low prices."

PUBLIC HEARING DECEMBER 17 TO CONSIDER QUARANTINE ON ACCOUNT OF THE "PHONY" PEACH DISEASE

A public hearing to consider the advisability of quarantining the States of Georgia and Alabama on account of the "phony" peach disease was announced by the United States Department of Agriculture. The hearing will be held before the Plant Quarantine and Control Administration and the Federal Plant Quarantine Board, in the Office of the Administration, 1729 New York Avenue, Washington, D. C., at 10 a. m., December 17.

The "phony" peach disease was first observed at Marshallville, Ga., perhaps as early as fifty years ago. It is now present in about 90 per cent of the commercial peach orchards of Georgia and also in a limited adjacent section of eastern Alabama. However, surveys made in 1926 and 1927 in North Carolina, South Carolina, Mississippi, and Florida, failed to disclose this disease in those States.

Special investigations begun in 1921 by the Bureau of Plant Industry of the United States Department of Agriculture to determine the cause of the disease and methods of control have resulted during the last two years, particularly through more complete experiments in 1928, in finding that the disease is communicable and is spreading in the manner of a contagious disease, but the exact cause or nature of the contagion is unknown. From these discoveries it appears advisable to control the nursery stock from the infected areas in an effort to prevent its spread to other peach districts. Fruit from "phony" trees apparently can not transmit the disease and, accordingly, no restrictions on fruit shipments are contemplated.

With the onset of the disease, a "phony" tree develops shortened internodes, a large number of lateral twigs, and large, flattened, dark-green leaves giving the appearance of compact, dense growth with very healthy foliage. With each additional year after the disease appears, there is a notable decrease in the average size of fruit and in the number of fruits to the tree, and the fruit is apt to be distinctly poorer in flavor than normal fruit though slightly better in color.

Not only does it seem possible that this disease may invade peach-growing districts beyond the borders of Georgia and Alabama, but the positive results of experiments where almond, apricot, and nectarine were top-worked on "phony" trees suggest that the disease might also attack fruits closely related to the peach if introduced into the districts where they are grown.

JAP PERSIMMONS CAN BE GRAFTED ON WILD STOCK

Japanese persimmons may be grafted or budded on the native wild persimmon, says Harold Mowry, assistant horticulturist at the Experiment Station. Grafting gives better results than budding as a usual thing.

During the month of January is perhaps the best time to do this grafting, although it may be done any time during the dormant season. An ordinary whip graft should be used on small stock, or a clef graft used on larger stock. When the whip graft is used it is ordinarily placed just at the soil surface.

Agricultural Pests

Plant Pest Control Subject of Report

The guarding of the Nation's crops, including its forest resources, from the entry of new insect and disease hazards, together with the waging of war on certain recently introduced pests, has been the work of the Federal Horticultural Board since the passage of the Federal Plant Quarantine Act, August 20, 1912. This first phase of the plant quarantine activities of the department ended last June with the reorganization, effective July 1, 1928, of all the work of the department of this nature under a new unit called the Plant Quarantine and Control Administration. This unit not only covers a wider field of activities but is given authority and a financial structure better adapted for mobilization to meet new crop pest emergenies which may appear from time to time without warning. This reorganization is discussed in the final report of the Horticultural Board submitted to Secretary Jardine by C. L. Marlatt, Charman of the Board, who continues as the Chief of the new Administration.

Introduced crop pests include many of the important plant diseases and insect pests of our farms, gardens, orchards, and forests. A host of these have been in the country so long that they are now thoroughly established and wide-spread, and their depredations must continue as an annual charge on agriculture, increasing the cost of the Nation's food supplies and other farm and forest products. Among those recently introduced which have still only a limited distribution and, therefore, subjects of control activities, are such invaders as the pink bollworm of cotton, the European corn borer, the Japanese and Asiatic beetles, the gypsy and brown-tail moths, the white pine blister rust, and many others. The enforcement of quarantine restrictions on the movement of the products attacked by these pests, represents one of the most important of the department's plant quarantine activities.

To aid in this work Doctor Marlatt notes with approval a Congressional amendment to the Plant Quarantine Act which became effective May 1, 1928, and gives "authority, hitherto lacking, to stop and—without warrant—to inspect, search and examine persons, vehicles, receptacles, boats, ships or vessels, and to seize and destroy or otherwise dispose of plants and plant products or other articles found to be moving or to have moved by interstate commerce or to have been brought into the United States in violation of quarantine orders." The importance of this authority in the enforcement of restrictions on the entry of plants and plant products at our ports and in the enforcement of domestic plant quarantines will be readily understood. In relation to the latter, Doctor Marlatt adds, "it is a perfectly natural and frequent habit for motorists and others to pick up in the course of their trips, articles, the movement of which is prohibited or restricted on account of pests, and carry them long distances." He also mentions that the presence of roadside stands has caused considerable unintentional violation of regulations.

The enforcement of the foreign plant quarantines forms a distinct feature of the work, with inspectors on duty at principal ports of entry. On one phase of the work, the Mexican border service, Doctor Marlatt comments on the increased labor of keeping the Mexican border closed to undesirable insect invaders because of the increasing number of bridges over the Rio Grande. He mentions repeatedly the cordial cooperation Mexican officials have extended, even in instances when it worked hardship on Mexican citizens. A series of reference tables summarizes some of the foreign quarantine activities. Inspectors visited more than 27,000 ships entering United States direct from foreign ports and found contraband articles on approximately one-third of them. More than 17,500 cars of the 41,000 inspected before entry from Mexico were fumigated by the Board.

Of 77 airplanes inspected, 12 were found to be carrying material contraband under quarantine regulations. "During the fiscal year," says Doctor Marlatt, "the inspectors and collaborators of the Board collected on or in imported plants and plant products 579 recognized species and 515 insects which could be assigned to family or genera only. These interceptions included many pests known to be injurious to agriculture." Interceptions of prohibited plants and plant products numbered nearly 17,000, with baggage and mail accounting for most of these.

In the discussion of the domestic plant quarantines, Doctor Marlatt devotes particular attention to the outbreak of the pink bollworm in several counties in Western Texas which was discovered early in the year. The importance of this outbreak lies in the fact that this pest, one of the worst of known cotton enemies, is now brought in direct contact with the main cotton belt. It will be recalled that the pink bollworm appeared in Louisiana and Texas in 1917 and was there eradicated by the non-cotton area system, in which fields were kept clear of cotton from one to three years. The report discusses in some detail the successful efforts to get authority and support from Congress for the application of the non-cotton system to this new outbreak in Western Texas, efforts which resulted eventually in the securing of a $5,000,000 appropriation for farmer reimbursement under a plan somewhat similar to that hitherto followed. The report explains certain inhibitions which were incorporated at the last moment in the language of this appropriation which made it impossible, under the conditions obtaining in Texas, to make use of this appropriation in connection with the crop of 1928, and therefore this western invaded area was again planted to cotton. The report points out that "a more favorable period for eradication will not return," but it is possible that, with the existing quarantine control, spread can be prevented if infestation in this area should reappear this year (1928), and in that event a non-cotton zone could, with State and Federal cooperation, be declared and made effective as to the crop of 1929. With respect to the crop of 1927, which was very lightly infested, the report indicates that all steps possible to eradicate the pest were taken. These included the tracing of all cotton and seed that went out of the district, the sterilization of all remaining seed, the cleaning of gins, mills, and concentration points, and the safeguarding, under quarantine restrictions, of the movement of cotton line and related products.

The report also discusses one of the Board's latest quarantine activities, namely, in relation to the stamping out and the prevention of further establishment in the lower Rio

Continued on page 27

CITRUS COMMENTS

—BY—

Charles D. Kime, Orlando, Florida

This department is devoted to furthering horticultural interests of Florida. Letters of inquiry, discussion or criticism will be welcomed.

Some Whys of Fall Fertilizing

The following are some of the favorable results sought and often secured through the proper balance of the fall fertilizer when applied in sufficient quantity:

Cold Resistance is Increased.

Better Fruit Shipping Quality.

Improved Fruit Quality.

Disease Resistance of Fruit and Tree Increased.

Scale and Insect-pest Toleration is Increased Enormously.

Tree Growth and Leaf Growth Matures Normally.

Bloom wood matures in shape for setting fruit.

Actual bloom set greatly improved.

INCREASED C O L D RESISTANCE is secured by that balance of food materials that apparently exceeds actual requirement of the plant on potash first, phosphate second, together with the use of highly available nitrogen sources. According to the usual method of listing formulas a 4-8-10 or 4-8-12 is very close to the desired relationship between elements though the tonnage applied (pounds per tree) is always the deciding factor for results secured.

Fruit Shipping Quality

Many times during the year falling prices are blamed on "rot in transit" or poor quality. Fertilizing with heavier amounts of potash and phosphoric is the one sure way of improving carrying quality. Control of insect pest and diseases adds to the appearance and aids in improving quality but the fertilizer applied definitely gives the degree of improvement.

Other results of such high analysis.

QUALITY. A discussion of fruit quality is not in order here, but potash first, then prosphoric, calcium and other materials are necessary to good quality. By good quality here we mean: smooth outside texture, the rind must be smooth, thin, and tough; good color for the variety that runs uniformly all over the fruit; smooth, pleasing, juicy appearance of the inside when sectioned with a knife across the segments; good, pleasing combination of acid and sugar in the juice and plenty of juice. When cut, a real fruit will aways spill juice freely and tend to spring apart, because of internal stresses due to being packed so tight with juice. Such quality originates in the grove and is not an accident. There are many controllable reasons for its absence, and it is markedly influenced by the sources from which plant foods are taken.

RESISTANCE T O DISEASE. There is just enough truth to the idea of inoculating for disease resistance to give unusual remedies some weight and sales argument. Many things have been tried repeatedly only to be disappointing when adapted to grove care in other locations. Actual inoculations of various materials have failed, soil inoculations for specific purposes have failed when applied to other sections as a blanket remedy.

Availability of Fertilizer Important

Strictly scientific definition of availability and its effect cannot be carried over into field work successfully even by the scientific worker. In lieu thereof, we can take general statements and working from them, line up what we need rather accurately.

NITROGEN is always thought of in connection with forcing growth of fruit and tree and changing tree color. Lack of it seems to slow down or actually stop all favorable tree activity. It is necessary, therefore, to keep the grove working. As the working stimulator, it is always the most important, regarding amount used and sources.

PHOSPHORUS is necessary to the tree for many things not well understood. Its effect is not easily apparent. Its lack can usually only be approximated after it has reached the point where total crop production is running low. There are other materials besides phosphorus that also fill this material building need of the tree, so the lack of any one can easily be confused with the absence of another. As a result of this confusion, the only safe procedure is to keep up a good phosphorus content in each application and in this way take care of reversion to unavailable forms and actual loss of material. Among the other important materials are iron, calcium, magnesium, sulphur, etc., these last apparently being needed in much smaller quantities than phosphorus, tho the total absence of one of them often proves the limiting factor in getting any growth whatever and, conversely, a too abundant supply also prevents proper growth, or may cause injury.

POTASH is the third material supplied in quantity to citrus. For field use, many growers apply it with the idea of getting proper and normal maturity for tree growth and fruit formation. They think of it as the finishing agent or process, in growing good fruit. In field work, potassium in several forms does seem to do this very thing, tho here again its effect can be carried too far and the tree "hardened-up" to such an exten that a load of dynamite is needed to prize it loose.

Using these field definitions, it is high time to wonder again, "Why fertilize in the Fall and use what"?

The actual utilization of fruit-producing plant foods by citrus trees seems very definitely governed by the effect of the total nitrogen supplied in applied fertilizer. This total supply being figured from commercial fertilizer and any other sources such as cover-crops, etc. This nitrogen supply, according to very reliable investigations, carried on with many varieties of plants and to a limited extent with citrus, determines the amount and rate of the vegetative growth of the plant and in proper balances with other plant foods, definitely stimulates fruitfulness.

The nitrate proportion seems therefore to be of vital importance

1st In stimulating tree activity

2nd In directly controlling the uses made by the tree of all other plant food materials. i. e. whether applied to growth alone or growth and fruitfulness.

Continued on next page

Citrus fruit industry, a trade - Laws & regulations

Regulations Issued Under New Standard Container Law

Growers who use baskets which are illegal under the Standard Container Act of 1928 should dispose of such baskets prior to November 1, 1929, the United States Department of Agriculture has announced in connection with regulations covering administration of the act.

The act applies to baskets in both intrastate and interstate commerce. Growers are advised by the department to regulate their purchases so that all nonstandard baskets will be disposed of before November 1, 1929.

Another effect of the law, in the opinion of the Solicitor for the department, is to make inoperative all State laws fixing weights per bushel for fruits and vegetables, when such commodities are sold in baskets meeting its requirements. This means that no State law which is in any way in conflict with the Federal Act, either in the matter of prescribed weights or dimension specifications, can be enforced as to fruits and vegetables sold in hampers and baskets which comply with that act.

The Standard Container Act of 1928, passed during the last session of Congress, fixes standards for hampers, round stave baskets and splint baskets for fruits and vegetables, and for other purposes. Administration of the law is in the Bureau of Agricultural Economics, which bureau is also administering the act of 1916 to fix standards for Climax baskets for grapes and other fruits and vegetables, and to fix standards for baskets and other containers for small fruits, berries, and vegetables, and for other purposes.

The new legislation defines standard hampers and round stave baskets for fruits and vegetables to be of the following capacities:One-eighth bushel, one-fourth bushel, one-and-one-fourth bushels, one- and- one- half bushels, and two bushels. For the purposes of the act a bushel, standard dry measure, has a capacity of two thousand one hundred and fifty and forty-two one-hundredths (2150.42) cubic inches.

Standard splint baskets for fruits and vegetables, under the act, shall be the four-quart basket, eight-quart basket, twelve-quart basket, sixteen-quart basket, twenty-four quart basket, and thirty-two quart basket, standard dry measure, a quart standard dry measure having a capacity of sixty-seven and two-tenths (67.2) cubic inches.

The legislation requires that "no manufacturer shall manufacture hampers, round stave baskets, or splint baskets for fruits and vegetables unless the dimension specifications for such (containers) shall have been submitted to and approved by the Secretary of Agriculture." Also, that "it shall be unlawful to manufacture for sale or shipment, to offer for sale, to sell, to offer for shipment, or to ship, hampers, round stave baskets or splint baskets for fruits and vegetables, either filled or unfilled, or parts of such hampers, round stave baskets, or splint baskets that do not comply with this act."

The department regulations declare that a basket or hamper the gross dimensions of which are such as to give to the untrained eye the appearance of a greater or lesser capacity than that of a standard container, or which is not readily distinguishable from another standard container, is of deceptive appearance.

Copies of the regulations which define the capacity and appearance of containers, tolerances and variations may be obtained from the Department of Agriculture, Washington,D.C.

CITRUS COMMENTS

Continued from preceding page

When nitrogen is overly abundant in an available form, the rate of growth of the tree seems to increase unduly, green color becomes darker and frenching begins to occur in subsequent growth showing very plainly in an inability on the part of the tree to properly utilize the unbalanced nitrogen. If held back in its effect through proper balance with available phosphorus and potash, normal growth will generally occur and the grove remain in good condition. But if availability of the applied nitrogen is increased by weather conditions, as occurs in hot rainy periods, there will be temporarily a large increase in available nitrogen unaccompanied by sufficiently large increases in phosphoric and potash and a very serious, over-forced condition occurs, during which time the tree shows active symptoms of over-ammoniation. The over supply of nitrogen during periods of plentiful moisture is very serious and must be closely anticipated ahead of time, as the transfer of the material from the soil to the plant through the roots occurs freely and rapidly at that time.

During dry, cold, weather, the absorptive process is slowed up enormously and we have a condition of starvation even though there is a plentiful supply at hand.

In the field, temperature and moisture conditions quickly decide the rate of absorption. Low temperatures may practically stop all plant activity and always slow it up. Low temperatures affect plant food transformation just as quickly. Conversion by soil organisms occurs much more slowly. The plant food elements go into solution very slowly. This is easily realized if we note how slowly milk sours from effect of lactic acid bacteria in cold weather, and how slowly any salt will dissolve in cold water as compared to hot water. Excessive applications of nitrate will accumulate in the soil and especially when applied in organic form. They will become available in quantity the following season when moisture becomes more abundant and temperature higher, but what of it? There is no objection to cutting down from a four per cent ammonia formula which may be supplied in the Fall to one running only two or three per cent, or there may be no objection to cutting down the pounds applied in the Spring in anticipation of excessive availabilities and if this does not suffice, the June or early summer application can always be altered to correct deficiencies in the former applications, or it can be omitted entirely if absolutely necessary with less chance of bad results than any of the other two applications. If a grove is fertilized only twice a year, or more than three times, the above line-up offers a very practical field procedure that works, as has already been established by many growers.

It is true that continued applications of nitrogen when a part of it goes unused, will cause an accumulation in the soil that may prove harmful by becoming available in

Continued on page 32

Florida Entomologist is Nationally Known Authority on Thrips Insects

By J. Francis Cooper, Editor, Florida Experiment Station

"Quick, Watson, the microscope," might well be the expression used by entomologists of the United States as a paraphrase of the famous saying by Sherlock Holmes. Professor J. R. Watson, the Watson referred to in this instance, is not the famous detective's right hand man, but rather is entomologist at the Florida Experiment Station and a nationally known authority on a class of insects called thrips.

When the Graf Zeppelin came over from Germany recently, two of the passengers were wearing boquets of chrysanthemums. In looking over these boquets inspectors of the Federal Horticultural Board discovered some innocent-looking little thrips and immediately sent them to Professor Watson for identification. Professor Watson makes frequent identifications of thrips for this board, as well as for entomologists scattered throughout the United States. He has identified thrips from a number of European countries and from Honduras and South American countries.

In 1923 Professor Watson published as a Florida Experiment Station Bulletin a synopsis and catalog of the Thyanoptera of North America. Thysanoptera is the family name for thrips. This work described 86 genera and over 300 species of thrips.

When an entomologist discovers an insect which has not previously been described in published literature, he ascertains first to what family it belongs. Then he determines the genus, or the next group under the family. If it is a new species, he names the insect. In the scientific world it is customary to add the name of the man who describes a new species or a new genus to the name of the species or genus.

Professor Watson has been first to identify and describe about 10 new genera and nearly 100 new species of thrips, and they are named for him.

He is still discovering new species at frequent intervals. By the adoption of a rather novel plan, he is able to find a large number of thrips that had not previously been discovered. A large funnel with a rack over the top of it is placed in a bottle of alcohol. Moss, bark, trash, and other materials containing thrips are placed on top of the rack. As the material dries out, the thrips go down seeking moisture, fall into the funnel and are caught in the bottle of alcohol. They are then put under the microscope for identification.

Thrips range in size from 1-50 inch to almost 1-3 inch long. One of the most injurious members of this large group is the common Florida flower thrips, which gets into the bloom of tomatoes and causes it to drop before the fruit is set. It also scars oranges.

The main injury done by thrips is the sucking of sap and juices from the tender plant parts, which causes a drying up of the affected parts. Professor Watson says the way to control them is to dope them up with tobacco. Tobacco decoctions sprayed thoroughly into each flower under high pressure will generally result in death to most of the thrips.

Suggestions for Reducing Losses from Stem-End Rot

By H. E. Stevens, Senior Pathologist, U. S. D. A., Orlando, Florida

There has been considerable loss this season in many of the packing houses throughout the State from stem-end rot of citrus fruits. The trouble has not been confined entirely to the packing houses, but large percentages of decay have been reported in the early shipment on arrival at the markets, which has caused a decline in prices and demand for Florida citrus fruits.

In order to get the fruit on the market in the best condition possible it must be handled with extra care from the tree through the packing house into the loaded car.

The fruit crop this season was not in the best condition for ordinary handling. That within the storm area and that subjected to high winds had been beaten and bruised, making it more susceptible to rots or other injuries that might occur in the ordinary handling of the fruit in the coloring rooms. We have found that such weakened fruit is more easily injured by the gas treatment either in the production of rots, or blemishes, and marks on the surface of the peel.

With this in view the following suggestions are made for reducing the percentage of rots and injury to the lowest point possible.

Careful handling and picking and transporting the fruit to the packing house is the first requirement. Fruit that is bruised, punctured by long stems or clipper cuts will develop rots and blemishes more easily than friuts that are free from these.

Most of the trouble has developed through the use of the coloring process and it is here that greater precautions must be taken, than in ordinary seasons. Fruit that is too green or immature should not be colored even though it has just passed over the required test. The fruit should not remain longer than 72 hours in the coloring room. If it does not color during this period it should be left on the trees.

Long exposure under conditions generally found in the coloring rooms will cause an unusual development of stem-end rot if the fruit is at all subject to this rot. The temperature and humidity should be carefully watched. Temperatures should be kept below 90 degrees F. and 80 degrees F. or lower is preferable. The humidity should run about 80 to 85 percent.

Stove gas seems to have given less development of Stem-end Rot which is probably due to better ventilation in connection with the use of this gas, but the temperature and humidity must be watched. Where ethylene gas is used ventilation is a necessary requirement. A charge of gas should be given every six to eight hours with a period of ventilation of one hour to a half hour in between each charge. Where the fruit shows 75 to 80 per cent color, it can be

Continued on page 27

JACKSONVILLE PUBLIC LIBRARY

IMPRESSIONS

By The Impressionist

Fruitman's Club

Our impression is that many outside, and some inside, citrus circles now and then get a bit confused regarding the different organizations past and present which take their membership from among the growers and shippers. The oldest is the Florida State Horticultural Society devoting itself to cultural problems, an organization largely composed of citrus growers, aided and abetted by all shipping organizations large or small without exception. The Fruitman's Club is now practically defunct, though it has not been formally disbanded. Its activities ceased with the formation of the Clearing House. This was a somewhat informal but at times quite effective organization of all the larger and most of the smaller shippers, devoting itself to problems concerning packing, shipping and selling. Some persons mention the Fruitman's Club as if it had been an organization of the commercial shippers solely, with the then one cooperative in the state outside. On the contrary, the Florida Citrus Exchange was a charter member of the Fruitman's Club and continued in active membership throughout its life. The Florida Citrus Shippers Association was an organization, now to be regarded as dead, of approximately thirty shippers designed to perform those functions now turned over to the Clearing House. The Exchange did not at any time belong to it. The life of the Florida Citrus Shippers Association was only a few brief weeks. The Growers and Shippers League is over five years old now and still thriving. It confines itself to representing the citrus and vegetable industries in traffic matters; and to it is due credit for the recent line-haul rate decision, and the forthcoming refrigeration reductions. Practically all the shipping concerns in these lines are members. Some charge the dues per car back to their growers, but the larger number of shippers have been bearing the costs out of their own pockets. The League must not be confused with the Clearing House though J. Curtis Robinson who is now general manager of the Clearing House is retained as executive vice-president of the League. The Florida Citrus Growers Clearing House Assn. is the newest organization of all. Its present aims are standardization of grade and pack, advertising, and equalization of distribution. These may be augmented later. A majority of the citrus shippers are members of both the League and the Clearing House, but the membership list is not identical; and, with the exception of J. Curtis Robinson, the officers and directorates are different.

We noted that some typographical errors detracted from, though they could not spoil, Mr. Joshua Chase's very fine narrative of his South American journey in last issue. Those things will creep into whatever is set in print, even the Bible and the dictionaries. However, publishers do not enjoy seeing them any more than do average readers.

Under the circumstances that issue was really better than properly could be expected. Enroute to our printing plant at Bartow from Tampa our beloved associate S. L. Frisbie contrived by the aid of a broken spring to turn his car over twice, end for end. Luckily he was preserved to us with only some minor bruises. Just the same we imagine that at the time THE CITRUS INDUSTRY was being "put to bed" he was about in the frame of mind of the fellow who explained his presence in the wrong room of a hotel by admitting that the figures 1 and 3 looked much the same to him.

John D. Clark, well known citrus grower of Polk county who resides in Bartow, hails us upon an Orlando corner. John, it seems, is abroad looking for the latest in scientific and practical knowledge concerning chicken houses. He is apparently as thorough in this as is his habit in other things. Son of the late W. W. Clark of Wall Springs, one of the foremost South Florida figures of the passing generation, John Clark is a most thorough business man.

It used to be our belief that the late W. W. Clark was the one man to command courtesy and respect at the hands of Colonel Peter O. Knight, who by the way is no little one-horse citrus grower but rather an extensive one. Then one day we overheard the two discussing old times, and we got the impression that Mr. Clark had enough "on" the Colonel to account for the latter's unfailingly cordial treatment.

Now Winter Haven comes in for new honors. The Sherwin-Williams Co. in invading the Florida citrus field with their established line of insecticides has selected Winter Haven as a main distributing point. Ray C. Hickman, well known to the growers, is already on the job for them at Winter Haven, and complete stocks of supplies will soon be available there for distribution over the citrus belt through local dealers.

The dizzy pace of citrus has claimed another victim. This time it is Gus Gentile, youngest of the Gentile brothers, who though not an officer of their company has been in charge of Polk county operations from Haines City. Gus' breakdown has necessitated his retirement from the business, and he has disposed of his interest in the company to his brothers. Along with a whole lot of other warm friends of Gue Gentile, we sincerely hope for his early recovery.

Though we have not yet seen him we are mighty glad to learn that A. B. Michael is back home at Wabasso after his long stay at Battle Creek Sanitarium, and that soon he will be getting into harness again. There are many who will rejoice with us at this news.

Frank Skelly is still in St. Vincent's hospital at Jacksonville, and continues to progress with his recuperation. Drop in and see him when next you are passing through Jax. C. R. Pilkington continues in Johns Hopkins hospital at Baltimore. His recovery while slow is reported to be satisfactory. The American Fruit Growers folks miss them greatly from their line-up, and personally we miss them a lot.

And more than we care to say we miss William Justice Lee, treasurer of Chase & Co. who will continue to recuperate for a time at Saranac

Continued on page 22

The Citrus Industry

with which is merged The Citrus Leaf

Exclusive publication of the Citrus Growers and Shippers

Address all communications to the Main Office
415 Stovall-Nelson Building
Tampa, Florida

Telephone ____ 4819

S. L. FRISBIE, Editor and Manager

FRANK KAY ANDERSON ____ Assistant Manager
A. G. MANN ____ Production Manager

Published Monthly by
Associated Publications Corporation
Tampa, Florida

Subscription, $1.00 per year in advance

Entered as second-class matter February 16, 1920, at the postoffice at Tampa, Florida under the act of March 3, 1879.

Branch office and production plant, Bartow, Florida.

NEW YORK OFFICE
350 West 55th Street
Phone Columbus 8244
FRED SHERWOOD CLARK, Manager

CHICAGO OFFICE
28 EAST JACKSON BOULEVARD
Telephone Harrison 1233
William Robert Shannon, Manager

GROVE CALENDAR FOR DECEMBER

Timely Hints for Grove Work During the Present Month

Finish banking young trees if this work has been neglected.

Keep rust mites under control.

Set young trees. Water well and bank thoroughly.

Prune out dead wood, treating large cuts with tree wound dressing.

If groves are very dry, irrigate if possible.

WORK FOR THE GROWER

Florida citrus growers and shippers have just set up an elaborate clearing house organization which is now functioning. This organization is doing much in the way of controlling distribution, standardizing grade and pack and is beginning an extensive campaign of national advertising. Along these lines, the clearing house is doing the work for which it was created and is accomplishing much for the entire industry.

But there is a work entirely outside the province of the clearing house, a work for the individual grower and grove owner, without which much of the effort of the clearing house must go for naught.

We refer to the QUALITY and APPEARANCE of the fruit leaving Florida for Northern markets. As usual, fruit of good quality and appearance is bringing a good price, while fruit of poor quality and appearance is selling in Northern markets at a price below the cost of production, to say nothing of packing charges, transportation and brokerage fees.

On December 11, the range of prices on oranges in the New York market was from $1.15 to $9.15 per box. The range on grapefruit was from $1.55 to $6.35. On tangerines, from 75 cents to $4.25. This range is accounted for solely on the basis of quality and appearance. Fruit of good quality and appearance netted the grower a handsome profit. Fruit of poor quality and appearance sold for less than cost of production.

No sales organization in the world can sell fruit of poor quality and appearance at a fancy price. No clearing house control of distribution can remedy the evil nor materially shorten the range between fruit of fancy grade and fruit that is off quality, off color and off size. Only the grower himself can remedy this situation.

It is true that much may be accomplished by control of distribution, by standardization of grade and pack and by consistent national advertising. The Clearing House Association can and will care for that. But the grower alone can control the matter of quality and appearance of the fruit he offers to the trade. Until the percentage of fancy fruit is raised; until the average of quality and appearance is brought up to a higher standard, there will continue to be the wide range of prices noted above, with the grower of fancy fruit reaping rich rewards and the grower of off grade fruit pocketing a loss. The sooner this fact is recognized and acted upon, the sooner will Florida citrus growers realize the reasonable profits to which they are entitled.

MORE OUTSIDE ADVICE

During the past year Florida citrus growers have received a lot of advice from outsiders—from people who know little, if anything, of conditions in the citrus industry of Florida. Some of this advice has been good; some of it has been bad, and much has been mere speculation on the part of idlers with nothing better to do.

The latest bit of advice comes from a California architect who tells Florida growers that "Florida fruit is dumped on worthless markets because Florida citrus men haven't sense enough to stop it," adding that California shippers do not ship to such markets.

Doubtless Florida growers may learn much from California. Floridians do not assume that they know all there is to be known of citrus culture or citrus marketing. The fact that they have recently perfected a citrus clearing house for the control of distribution and the solution of other grower and shipper problems, shows that they are alive to this fact and that they are seeking a betterment of conditions in a reasonable and sensible way. They have sought the suggestions and advice of California growers

and shippers in the solution of their problems, and have doubtless profited by the suggestions they have received.

Naturally, however, Florida growers resent the imputation of a California architect that they lack the sense to seek a solution of their own problems. Doubtless this California architect would resent it should a Florida citrus grower visit California and declare that California architects were lacking in sense sufficient to draw their own building plans. Florida citrus growers look upon his statement in much the same light.

Florida citrus growers have many problems yet to be solved, both cultural and marketing, and they seek suggestions from citrus growers of other sections, but we trust they may be forgiven if they prefer the advice of a citrus expert to that of an architect in the solution of citrus problems. As The Citrus Industry has previously remarked, Florida's citrus problems must be—and are being—solved by Florida growers themselves—with the aid and suggestions of competent citrus men from other fields.

STUDYING FLORIDA CONDITIONS

The Palestine Citrograph, a citrus publication of Jaffa, Palestine, in the heart of the Jaffa orange region, is printing a series of articles by A. Friedman, a citrus expert and traveler, under the general subject of "Florida Citrus and What it Can Teach Us."

The articles are very interesting and cover the field of citrus culture in all its aspects, including cultivation, fertilization, spraying, dusting and fumigation, and incidentally, marketing.

The articles are illustrated with Florida grove scenes and give a very accurate idea of the citrus situation in Florida. The author believes that many of the practices of Florida growers might be found adaptable to conditions in Jaffa. The articles are very interesting indeed, and show that the author has made a careful study of citrus conditions in Florida.

The grower with an adqeuate supply of grove heaters doubtless congratulated himself these recent cold nights—even though he had no need to bring his heaters into use.

Many growers neglected their groves last season, and the result is seen in small, off grade fruit. Just a little additional investment in fertilizers and insecticides and a little additional care of groves would have made a vast difference in many a grower's bank balance.

A considerable acreage of new groves is being planted in certain sections. For the most part these new plantings are being made by experienced growers. This is encouraging. The capable grower knows there is profit in the business, and is enlarging his groves.

Word from Texas is that citrus growers there are more than ever convinced of the success of their project. With six years experience behind them, they see a brilliant success just ahead.

"Money is like time . . . lose none and you will have plenty"

—Maxims of Pierre Gaston.

MONEY—time—citrus stock. These three things are bound to claim your interest. You plant orange or grapefruit trees, put forth a world of time and effort—and hope that when the trees come into bearing they will repay you handsomely.

But what could possibly compensate you for the loss of time were your trees to fail? How small an investment the actual trees really amount to—compared with the cost of the land, its preparation for the trees and the subsequent expense of care and attention!

Yet the tree is the most important factor of all. From what source can you obtain your nursery stock to eliminate all gamble? Why not accept the verdict of thousands of successful Florida growers who have depended on Glen-Grown trees for 10, 20, 30 years and longer?

Invest in Glen Citrus Stock and you invest in the best that money can buy—trees that fully justify all the time and attention you devote to them—trees that will fulfill your fondest expectations and make you money!

The Glen Saint Mary Nurseries maintain an experienced staff ready and willing to make suggestions concerning the proper varieties of citrus fruits for your particular land. Why not avail yourself of this free service? Gain time—gain money—write our nearest office today.

Glen Saint Mary Nurseries Co.

"World's Largest Citrus Nurseries"

WINTER HAVEN

ORLANDO TAMPA

"GLEN TREES ARE GUARANTEED"

"Please Say You Saw It In The Citrus Industry"

Potash Prices Stay Steady in Spite of Increased Use

Production at the Franco-German potash mines has been so geared up during recent months that, although America is consuming potash in increasing volume, there will be no increases in prices during the current price year, which ends next April thirtieth, it was announced today by Rene Gide and Robert Kunze, co-directors of the N. V. Potash Export My., a Dutch corporation which imports 83% of the potash used in the United States.

"All the information we have been able to gather from a wide variety of sources indicates that the agricultural situation in the United States in 1929 is more likely to improve than it is to be further aggravated," says the joint statement issued by the co-directors. "Our information leads us, moreover, to anticipate a considerable increase in the tonnage of potash used by fertilizer manufacturers and farmers next year. In order that a shortage of potash may not be created by this increasing demand, which would result in violent upward price fluctuations, we have made further efforts toward stabilizing the market by increasing the output of our mines abroad.

"We have established a quite regular production, shipping and distribution cost for our product and see no immediate factors that should disturb it. Experience has taught us that a price that varies only slightly works out for the advantage of all merchandisers and producers in the cycle of business enterprise. We are doing our part to bring price stability but when economic factors appear, which we are powerless to control, we of course must adjust our scale to meet these demands and thereby protect ourselves. But recently we have not experienced this condition and do not anticipate it. If the potash prices that hold today prevail for a long period, we predict that the consumption of all fertilizers will increase at a greater rate, that the fertilizer industry in general will move toward greater stability and that the final result will appear in a great improvement in American agriculture.

"The prices on potash salts for agricultural purposes for shipment from Europe between now and April 30, 1929 are as follows:

Muriate of potash, $36.40 in bags, $34.80 in bulk.

Sulphate of potash $47.30 in bags, $45.70 in bulk.

Sulphate of potash - magnesia $27.25 in bags, $25.65 in bulk.

Manure salts, $21.75 in bags, $18.75 in bulk.

Manure salts (20% K2O) $15.40 in bags, $12.40 in bulk.

Kainit (14% K2O) $12.50 in bags, $9.50 in bulk.

Kainit (12.4% K2O) $12.00 in bags, $9.00 in bulk.

"These prices are guaranteed against reduction in N. V. Potash Export My. prices for potash salts in the continental United States until April 30, 1929. All the bagged salts are sold on foreign weights, tares and analyses, while bulk salts are sold on American weights and foreign analyses.

"The potash situation in the United States is unique. American soils during the past 15 years have been depleted of their valuable potash and in some districts are now quite exhausted of this important plant food. In 1913 the United States consumed 250,000 tons of pure potash, and up to that year potash consumption increased on the average of 10 per cent a year. There was very little potash available after 1914 and up to 1919 the use of potash in the United States for agricultural purposes fell off amazingly because of the cessation of European imports.

"During the entire period of 1914-1927 the United States used 2,131,643 tons of potash. In 1919 the consumption was 73,778 tons and in 1920 it rose considerably, after which year there was a regular yearly increase that brought consumption to 290,000 tons in 1927.

"Germany, a country smaller than Texas, consumed 490,000 tons of potash in 1913-14 and in the year 1927-28 the consumption almost doubled, reaching 800,000 tons. France too has moved fast in the consumption of potash. In 1913 that country used 30,000 tons, whereas in 1927 she enriched her soils with nearly 170,000 tons, an increase of more than 450 per cent, compared with a five per cent increase in the United States for the same period.

"Potash deficiency in the United States already shows itself in crop diseases, such as cotton rust, cotton wilt, corn root rot, signs of potash hunger in some potato crops, in alfalfa and other legumes."

TIMELY HINTS FOR THE CITRUS GROWER

The following timely hints for the citrus grower are offered by E. F. DeBusk, extension citrus pathologist.

Guard Against Fires

Where groves have been mowed and left unplowed, a fire guard about ten feet wide should be plowed around the grove. In case of a very large grove, it might be well to plow a strip or two through the grove to aid in checking fires originating within the grove or blowing over the guard. All employees should be cautioned about dropping match stubs, cigar or cigarette stubs, in the grass or other dry litter. Much damage is done to citrus groves every year as the result of carelessness in regard to fires.

Bank Your Trees

It seems necessary to again call attention to the matter of banking young trees. As a matter of safety young trees up to four years old in case a cold snap should come, should be banked. This applies to all varieties of citrus in Central Florida, to unprotected areas in South Florida, and to Satsumas in North and West Florida. If this banking has not already been done it should be attended to at once. Make the banks large enough to withstand the winds and heavy rains and as high as practicable in order to protect the trunk in case of a freeze. If a cold wave is predicted see that banks are renewed where worn down.

Fall Clean-up Spray

Growers generally realize the importance and economy of the fall clean-up spray with oil emulsion. Many have found that by doing this spraying thoroughly and at the proper time, the much dreaded summer application may be omitted, except where Bordeaux-oil is applied in the spring for melanose. Fall and winter spraying should not be done when the temperature is running below 60 degrees F., as a satisfactory kill of scale cannot be attained under low temperature.

Vetch is being tried in Lake County as a cover crop in grape vineyards.

TEXIDE

A petroleum base insecticide designed especially to meet the needs of the citrus grower.

TEXIDE is so mixed that from 92% to 98% of the active oil content adheres to the tree and is available for insect kill. In ordinary oil sprays only about one-half the oil content sticks to the tree. This is one of the reasons TEXIDE is worth more than other oil insecticides.

Correspondence is invited.

THE TEXAS COMPANY

Texaco Petroleum Products

District Office, Jacksonville, Florida

Texaco Agents located in citrus centers:

Orlando	Clermont	Bartow	Fort Myers
Haines City	Lakeland	Leesburg	Kissimmee
Lake Wales	Tarpon Springs	Titusville	Cocoa
Avon Park	Tampa	DeLand	Clearwater
Eustis	Fort Pierce	Arcadia	St. Petersburg
		Dade City	

"Please Say You Saw It In The Citrus Industry"

Brand Suggests Disposition Muscle Shoals

A definite proposal for the disposition of the Government's property at Muscle Shoals was unanimously adopted by the southern convention of the National Fertilizer association at its concluding session in Atlanta recently.

This suggestion was presented by Charles J. Brand, executive secretary and treasurer, Washington. It represents the future policy of the fertilizer industry on this mooted question with which Congress has wrestled in vain for years.

The resolution follows in full:

WHEREAS, the National Defense Act of 1916 decrees that the government properties at Muscle Shoals shall be devoted to the production of nitrates or other materials needed for munitions of war and useful in the manufacture of fertilizers AND OTHER USEFUL PRODUCTS;

AND WHEREAS, the same act decrees also that the plant or plants provided for should be constructed and operated solely by the government and not in conjunction with any industry or enterprise carried on by private capital;

AND WHEREAS, under the existing temporary arrangements for the production and disposal of power, which are being handled as efficiently as circumstances permit by the War Department, electric power worth approximately $1,300,000 has been sold annually during the last two years—an income which could gradually be increased if contracts for the sale of power for longer periods could be executed with assurance that their fulfillment would not be prevented by legislation or otherwise, except in the event of war;

AND WHEREAS, nitrates can now be produced more economically by other processes than the cyanamid process, and by the use of coal at less cost than by the use of hydroelectric power;

AND WHEREAS, the national defense act does not authorize the manufacture of phosphoric acid nor the purchase of fertilizer ingredients, nor the making of complete fertilizers but the production of nitrates useful both in fertilizers and in other useful products;

AND WHEREAS, intensive investigations by the War Department have shown that, owing to changes and advances in the art of fixation of air nitrogen, the nitrate plants of this project are of little value for national defense;

AND WHEREAS, the area near Muscle Shoals and areas in contiguous states now have an insufficient supply of power or, with the development of industry soon will have, and plants for producing phosphoric acid and complete fertilizer in excess of the present demand are already in existence;

BE IT HEREBY RESOLVED, that The National Fertilizer Association, in convention assembled, petitions the Congress to authorize the sale, separately or jointly, of the Wilson Dam with its hydroelectric plant and the Steam Power Plant No. 2, safeguarding properly the public interest in navigation, flood control, and the development of the waterpower resources of the Tennessee River; and in the event that this recommendation is not acceptable or can not be worked out, that these plants be leased by the War Department to be operated under the supervision of th Federal Power Commission with the cooperation of such state commissions as may have a direct interest in their operation, and that if neither sale nor leasing is found feasible the government shall coutinue to operate the plants through the office of the Chief of Engineers, War Department, selling the surplus power produced at the switchboard to the highest responsible bidder, giving such preference as may be fair and just to power companies operating in the Muscle Shoals area, but under regulations to be prescribed by the Federal Power Commission; that if the plants are sold or leased proper provision be made for their recapture in event of national necessity, and if leasing is resorted to that a suitable block of power be reserved for the use of the United States Department of Agriculture for the purposes hereinafter described.

BE IT FURTHER RESOLVED, that The National Fertilizer Association hereby recommends that Nitrate Plant No. 1 (an experimental or pilot plant, constructed to use one of the modern fixation processes) be assigned to the Bureau of Chemistry and Soils of the United States Department of Agriculture with an appropriation sufficient to put it in condition for efficient experimental operation and with a suitable quantity of hydroelectric power for its use in chemical and technological research in nitrogen fixation, including the production of nitrates for making fertilizers and other useful products on a scale sufficient for agronomic and other experimentation; that manufacture be adjusted as nearly as possible to experimental and demonstrational needs, and that any product in excess of these needs be sold in accordance with the existing law governing the disposal of surplus government property.

BE IT FURTHER RESOLVED, that a sum equal to three-fourths of the income received from the sale of power, but not to exceed $750,000, shall be appropriated, under rules and regulations to be prepared and promulgated by the Secretary of Agriculture after consultation with an advisory committee of seven members, including three representatives of the fertilizer industry, for research in fertilization and plant nutrition and for experimental and demonstration work in the use of fertilizers on the farm, provided that the minimum sum alloted to any state shall be $8,000, and that the allocation of funds above the minimum to any state shall be made according to the relation of the total cultivated acreage of that state to the total cultivated acreage of he United States; and that a sum equal to one-fourth of the income from the sale of power, but not to exceed $250,000, shall be appropriated directly to the United States Departmnt of Agriculture to cover the cost of operating Plant No. 1 for research and experimentation.

BE IT FURTHER RESOLVED, that Plant No. 2, the cyanamid plant, shall be kept in standby condition by the Ordnance Department of the War Department for one to three years, in the discretion of the President, for such value as it may have for national defense; that at the end of the period determined the plant shall be sold to the highest bidder, except that the ammonia oxidation or nitric acid part of it may be retained for national defense on recommendation of the War Department;

BE IT FURTHER RESOLVED, that all proceeds from sales, whether of property, products or of power

Continued on page 24

BLUE GOOSE NEWS

Monthly News of American Fruit Growers Inc. *Edited by The Growers Service Department*

VOLUME 3.—No. 1 ORLANDO, FLORIDA, DECEMBER 1, 1928 PAGE 1

SEES GREAT ADVANTAGE IN CLEARING HOUSE

Just recently returned to Florida after several months absence in the North, A. B. Michael of Wabasso, one of the foremost citrus growers of the Indian River section, and regional vice-president of the American Fruit Growers Inc., expresses himself as very much pleased with the Clearing House as now organized and functioning.

"For a long time," said Mr. Michael, "I, along with other growers, have realized not only the desirability but the necessity for setting up some sort of central organization which would coordinate and unify the various selling activities on behalf of the Florida citrus industry. While recuperating at a sanatarium in the North, following a severe illness, I watched with great interest this past summer the newspaper reports concerning the progress of organizing a Clearing House. I greatly regretted my own inability to participate along with other growers who were giving their time and attention to this matter. However, I feel that they who did labor for the organization of the Clearing House, and along with them all the other growers of citrus fruits in the State, are to be congratulated upon the way the Clearing House has finally been worked out, organized, and is now functioning under the very capable management of J. Curtis Robinson and his able corps of assistants.

"It seems to me that it is now up to me and to every other citrus grower in the State to get squarely behind the Clearing House with an earnest and sincere support. We have no right to expect miracles. Particularly is this true during what will be the first year of actual activity for it is going to take some time to get a bit of business machinery as important and necessarily as complicated as this functioning upon the most efficient basis.

"My feeling is that if in this first active season the Clearing House should be able to do nothing more than to fully develop the work of the Inspection Department, that service

Continued on page 2

ORLANDO AND SANFORD DIVISIONS COMBINED

Consolidation of the Orlando and Sanford Divisions of the American Fruit Growers Inc. has been effected, and the new consolidated division is now functioning smoothly.

Previously the two divisions operated entirely independently, the Orlando Division confining itself to citrus fruits and the Sanford Division to vegetables with particular attention to celery and tomatoes. Both divisions have been signally successful in their respective filds, and each has maintained a high place in the rank of the various operating divisions of the big national organization.

The consolidation was brought about to effect economies in operating costs, and promises to be very successful in that respect. It was felt that two fully manned divisions with headquarters within twenty miles of each other could be further strengthened and worth while economies simultaneously effected by combining.

Headquarters of the consolidated division are now in Orlando where the citrus sales office also is located. The celery sales office remains at Sanford and will function from there throughout each celery shipping season. Added efficiency and simultaneous economy of operation chiefly is to be found in the consolidation of the accounting and traffic departments. More room has been taken upon the top floor of the Yowell-Drew Building, Orlando, and the entire force is now together upon the one floor, the arrangements making for convenience and efficiency. The American Fruit Growers Inc. now occupies the entire top floor of the Yowell-Drew Building, which previously housed the Orlando Division for approximately seven years.

CITRUS REVIEW AND MARKET OUTLOOK

Government figures of December first show that to that date there had been shipped from Florida 4,547 carloads of oranges, 4,277 carloads of grapefruit and 1,286 cars of mixed citrus fruits, a total of 10,110 carloads or 1,250 carloads more than for the same period last year from this state. Government figures include tangerines with the oranges.

On the same basis of figuring, orange shipments from Florida to that date were 729 carloads heavier than last year; grapefruit shipments exceeded those of the same period last year by 687 carloads; but shipments of mixed carloads were 176 less than last season.

Despite the fact that Alabama Satsuma shipments this season were greatly restricted, being far below last season's volume, shipments of oranges from all sources in the United States to this same date are reported by the government as 9,321 carloads as compared to 5,622 carloads last year for the same period. This is an excess of orange shipments for the present season over those of last season of 3,699 carloads, the bulk of which increase, of course, came from California.

Orange sizes have been averaging small from both Florida and California, and the fruit trade has been exhibiting the same aversion to small sizes which it usually does in the early part of the shipping season. Carloads of oranges running heavily to 250's and smaller consequently have met with very small demand, and have been difficult to place in practically every market.

Complaint also came from the retail trade of much decay after fruit had been opened in the stores, and undoubtedly this operated to reduce the damand from retailers and to a considerable extent curtailed early reorders.

As between the better quality and

Continued on page 2

Adv.

BLUE GOOSE NEWS

OFFICIAL publication of the American Fruit Growers Inc., Growers Service Department, published the first of each month in the interest of the citrus growers of the state of Florida.

EDITORIAL ROOMS
502 Yowell-Drew Building
ORLANDO, FLORIDA

SEES GREAT ADVANTAGES IN CLEARING HOUSE

Continued from page 1

alone will be worth to the industry more than the growers will pay toward the Clearing House operations this season. Mr. Harold Crews, who is at the head of this Inspection Service, and whose job it is to standardize grade and pack for every packing house shipping under the Clearing House supervision, is a very able man and fully equipped by experience to handle this work most satisfactorily. In selecting him for this work, I believe the Directors picked the best qualified man in the State.

"My observation to date shows his inspection reports are particularly complete covering every operation from picking the fruit until it is loaded in the cars. These reports going to the shipping agencies as well as to the general offices of the Clearing House, afford a check upon the efficiency of the operations of individual packing houses such as we have never had before. Further, the profit which should accrue to the Florida industry from being able to offer to the trade standardized grade and pack from the great majority of its packing houses, will be almost incalculable. Also it is a necessary accompaniment or must precede any active advertising for Florida citrus fruits as a whole, for unless there be a standardization of grade and pack, such advertising can not be expected to be of any great value.

"Like every other grower who has observed the work of J. Curtis Robinson since he took charge of the Growers and Shippers League of Florida five years ago, I have entire confidence in his ability to administer the active affairs of the Clearing House, and of his fairness at all times to each and every one of the various shipping factors involved in the operations of the organization.

"It would seem as if Mr. Robinson's selection for this place was a very happy solution of the problem of management. He is rather inclined to make haste slowly but is extremely accurate and painstaking and is apt to carry the organization through its early activities with a minimum of mistakes.

"Seemingly the thing which now is most needed is wholehearted support of the Clearing House by every grower and shipper member; and the assumption of a personal responsibility by every member to carry on outside the work of enlisting more and more growers as members. This Clearing House is no one's private affair. It is aimed to be of, for and by the industry as a whole. No grower can continue in the business of producing oranges or grapefruit in Florida and fail to benefit through the continued operation of the Clearing House. That being the case, each and every grower should be not only willing be actually anxious to perform his part. That can not be done simply by paying the per box assessment. Every grower should not only be enrolled as a member of the organization but should be willing to look after its affairs actively in his immediate vicinity. The Directors and the Executive Officers have a big job. Those functions which are peculiarly theirs they may be relied upon to discharge adequately, I believe. However, it is impossible for them to be in every growing point in the State and there is opportunity in every community to inspire confidence and enlarge the knowledge of the growers as to what the Clearing House is aiming to accomplish.

"Already in the rapid slowing of grapefruit shipments at what was a very critical period, and in inducing a restriction of small sized oranges in the beginning of the season, the Clearing House has accomplished a good deal. By these actions it made money for the growers. All of us believe some such organization as the Clearing House is needed and that such an organization is capable of being a real money maker for the growers as a whole. Now that we have such an organization set up and actually functioning and with an advertising campaign already started, it seems to me that it behooves us all to get behind it; and to stay behind it until it is a thoroughly successful adjunct to our industry."

CITRUS REVIEW AND MARKET OUTLOOK

Continued from page 1

sizes of oranges and poorer quality and small sizes there has been a very wide gap in market prices. At the auction points, where all sales are a matter of definite record, average prices for all Florida oranges offerings have run low. Yet at the same time Florida's top grades in the desirable sizes have realized higher average prices than has been paid for the highest priced California oranges in competition on the same days.

With cooler weather, always a stimulus to citrus sales, and better carrying quality of the Florida product, the outlook for Florida oranges in the desired sizes is apparently brighter. As long, however, as the trade is disposed to discriminate so strongly against anything sizing below 216's, it will remain extremely difficult to obtain satisfactory disposition of carloads running heavily to 250's and smaller.

At this writing there are signs of a clearing up of the grapefruit market which argues well for a most favorable outlook during the balance of the season. With an equitable distribution of shipments over the time remaining in which to market the grapefruit crop, the outlook must be considered quite satisfactory.

With the Clearing House organization now completed and functioning there is an improvement in feeling noticeable. First newspaper advertisements of the Clearing House made their appearance in the larger centers November 20, and broadcasting sponsored by the Clearing House over one of the big chains also has begun.

This advertising effort should soon exhibit effect, coupled with the individual advertising of certain shipping agencies. The American Fruit Growers Inc. for its part is carrying forward this season its most ambitious and comprehensive advertising campaign to date. Magazines, newspapers, bulletins, dealer helps and nationwide broadcasting are being utilized on behalf of Blue Goose fruits, which naturally involves the

Adv.

DRS. LESTER & SOLOMON

1011-1028 MARTIN BUILDING

BIRMINGHAM, ALA.

American Fruit Growers, Inc. November 5, 1928
Orlando, Florida.

Gentlemen:

As one of the growers whose fruit you are handling, I feel peculiarly interested in the extension of your progress as manifested by your bulletin issued from time to time to the growers, calling their attention to your recent advertising program.

I have noticed with considerable interest the full page advertisement in the Saturday Evening Post of October 6th with which you bring to the attention of the American public, in a very pleasing manner, that at this time of the year in the various markets of the world, beautiful and palatable and luscious fruit may be obtained.

Keep up the good work and you may rest assured that those of us who read, will help to spread the propaganda as it is helpful to your great public. Moreover, those of us who happen to practice medicine, like myself, are eternally your friends because we are trying at all times to give to the people more fruit and especially more citrus fruit. The Doctors are among your best friends as we feed it to those who are well and to those who are sick.

With all good wishes for your continued success, I am

Yours very truly,

(Signed) E. P. SOLOMON

featuring of oranges and grapefruit strongly at this time of the year.

The willingness of the markets right through November to pay most satisfactory prices for good fruit in desirable sizes, both oranges and grapefruit, should be a cause for optimism.

HEAVY SENTENCE IS GIVEN FRUIT THIEF

A declaration that a relentless war would be waged on fruit stealers was made in the Orange County criminal court of record by Judge W. L. Tilden when he sentenced M. C. McGill, negro, to five months in jail, gave him a fine of $50 and an additional two months in default of payment of the fine, for the stealing of oranges from a grove between Orlando and Pine Castle.

The negro entered the plea of guilty when arraigned. He was arrested on November 21 by Traffic Deputy Lawson as he was emerging from the grove.

Judge Tilden asserted that the practice of robbing groves in the county had become too frequent and said that all persons convicted of such an offense would be given heavy sentences by him. The sheriff and his forces were instructed to be vigilant in seeking such violators.

GRAPEFRUT OBTAINS ATTENTION IN BRITAIN

Mr. George J. Webb of Glasgow, Scotland, member of a large fruit handling firm there, calls attention to a recent cartoon in The Bystander of London, which is indicative of the increasing attention that grapefruit is now commanding throughout the British Isles.

It is a large and very prominent cartoon portraying a typical green grocer's stall presided over by a very typical British green grocer. Looking over his wares is a lady whom it must be assumed represents a typical average British housewife.

"What's grapefruit?" she asks, indicating a pile of the fruit surmounted by a card labeling them as grapefruit.

"Strictly speaking, it's a lemon that's been given a chance and taken advantage of it," says the proprietor.

Thus this British humorous paper handles the matter; and in so doing gives grapefruit even further publicity. Without the humorous picture accompanying, the jest loses considerable force; but due to The Bystander being printed in brown ink, which will not reproduce photographically, it is impossible to reprint here the artist's drawing which constitutes a big laugh all by itself.

ORANGE JUICE FREE TO BREAKFAST PATRONS

At least one live, wide awake restaurant man in Florida has recognized the necessity for stimulating interest in Florida oranges and he is giving free orange juice to his breakfast patrons.

The new Hoettler cafeteria in the San Juan hotel, Orlando under the management of C. R. Hoettler, is serving every patron a free glass of orange juice for their breakfast, no matter how little they may order at the cafeteria counters. Mr. Hoettler is bringing this fruit in from his own grove and is serving juice from the finest kind of Orange county product.

Adv.

UNIFORMLY

THE BEST

Call The Roll-

Call the roll of consumers. What symbol of quality in fruits and vegetables is best known to young and old, and most generally accepted as an invariable token of value? It is the Blue Goose trademark.

Call the roll of retailers. What spells profitable business through the waiting demand of confident customers during fifty-two weeks in the year? The Blue Goose trademark.

Call the roll of jobbers and wholesalers. What to them symbolizes fair dealing, understanding sales assistance, modern merchandising and year 'round profitable activity? The Blue Goose trademark.

Call the roll of growers of fruits and vegetables in whatever part of the country. What to them distinguishes the most progressive and intelligent activity in turning their crops into money, while continuously operating to stabilize and expand markets? The Blue Goose trademark.

American Fruit Growers Inc.

Orlando, Florida

DEPENDABLE AFG QUALITY

Adv.

National Horticultural Council

The National Horticultural Council

By John Napier Dyer, President

I am sure every fruit and vegetable grower of the country will be interested to know that an organization has been formed which promises to play an important part in solving the serious economic problems of their industry. It is called the National Horticultural Council. It was incorporated under the laws of Illinois on October 18, 1928. The first meeting of the 15 directors was held in Chicago at the Hotel Sherman, Chicago, on October 31, at which time by-laws were adopted, officers and an executive committee elected, and plans and policies decided upon.

Purposes of the Council

The fruit and vegetable interests of the country have been in serious need of an organization of this kind for some time. It is particularly important that our economic interests be ably represented in the next few years. The events of the recent political campaign indicate that the whole national policy toward agriculture is to receive serious consideration. The new basis of relationship which will be worked out will without doubt be in operation for a good many years. In order that the fruit and vegetable growers of the country may operate on a basis of economic equality with other groups, it is imperative that we have an organization like the Council to represent our intrests in the critical period that is before us.

The Council is organized with broad powers and will be in position to concern itself with any economic problem of fruit and vegetable growers which may present itself, including legislation, tariff and by-product questions, trade practices, encouragement of improved methods of marketing, and collection of information on economic questions. It is not intended that the Council shall do any marketing. It may encourage and foster improved methods of marketing and assist in establishing better laws and regulations pertaining to the same, but it will not engage in marketing itself. Neither will the Council engage in the purchase of supplies.

Origin of the Movement

The movement which resulted in the organization started at the annual meeting of the Indiana Fruit Growers' Association last December, where a committee was appointed to investigate the attitude of growers in other states toward an organization of this kind. The committee consisted of John Napier Dyer, W. C. Reed, R. A. Simpson and S. W. Holmes. This committee, assisted by Charles E. Durst, corresponded with leaders throughout the country. The correspondence indicated a general and genuine interest in the proposition.

The next step consisted in calling a conference at Chicago which was held on June 6 and was attended by representatives from practically every important section of the country. After full discussion, it was voted to organize. The general principles of organization and operation were decided upon, and a committee was appointed with authority to perfect the details and incorporate the organization.

The organization committee investigated similar organizations very carefully and conducted a wide correspondence with leaders of the industry to obtain their views. Tentative by-laws were submitted to all who attended the Chicago conference for consideration and suggestions. So well did the committee do its work that the by-laws presented by them at the recent directors' meeting were adopted without a single important change.

Officers and Executives

The officers consist of John Napier Dyer, president, F. L. Granger, first vice-president; Frank T. Swett, second vice-president; and Charles E. Durst, secretary-treasurer. The executive committee consists of John Napier Dyer, F. L. Granger, M. C. Burritt, Louis F. Miller, and Charles Carmichael. Charles E. Durst of Chicago, who has had a wide experience in the fruit and vegetable industries, has been appointed executive secretary.

Cooperation with other Organizations

The Council will not attempt to displace any other organization or appropriate its work. As a matter of fact, there is no other organization which is serving fruit and vegetable growers from an economic standpoint or is fitted by personnel or facilities to do so. These are highly specialized branches and require specially trained personnel if they are to be properly served. The council proposes, of course, to cooperate with all similar organizations which serve other branches of agriculture, and no doubt such cooperation will prove advantageous to all concerned.

Other Interests Similarly Organized

In considering the value of an organization like the Council, we must bear in mind that practically every business and industrial group in the country is similarly organized. When any question comes up which affects the interests of their members, these organizations are at once active. Steps are constantly being taken to advance the interests of their members and to oppose movements which adversely affect their interests. If fruit and vegetable growers remain unorganized, they must expect to face continued encroachment on their interests by other organized groups. The only way for them to protect their interests and insure economic equality for themselves is to be prepared to present their case effectively at all times through an organization like the Council. Especially is this going to be an important matter during the next few years in view of the reconstruction period through which we are going.

The active membership of the Council is to be made up of individual growers, horticultural societies and cooperative associations. The annual fee of individual growers is $5.00 plus 10c for each acre of fruit above 50 grown by them. Horticultural societies and similar educational organizations will pay an annual fee of $25.00, but this fee is not intended to give membership to their individual members also. Cooperative associations will pay an annual due of $50.00 plus 10c for each car above 50 handled by them, provided that the maximum fee of any association shall not exceed $500.00. The fee of cooperative associations is intended to serve for the individual members also.

Business organizations and individuals whose interests are related to those of fruit and vegetable growers may become associate members. Associates may attend meetings of the members but may not vote. The fee for individuals will be $5.00 per year and for corporations or partnerships, $50.00 per year, plus such additional amounts as they may care to contribute.

Suggestions for Handling Fruit in Coloring Room

By H. E. Stevens, Senior Pathologist, U. S. D. A., Orlando, Fla.

Recent experiments conducted at the U. S. Citrus Disease Laboratory, Orlando, Florida, emphasize the great importance of close attention to ventilation and dosage in using ethylene gas for coloring citrus fruits.

Poor ventilation retards coloring and increases the danger of direct injury to the fruit. Excessive doses of ethylene gas retard rather than hasten coloring, and may result in injury under poor condition of ventilation. Stove gas contains ethylene in dilute quantity and is consequently less likely to give trouble. A fair amount of ventilation is necessarily secured in blowing stove gas into a room. Damage may result from stove gas if not properly used.

To avoid coloring room injury, to secure rapid coloring, and to hold down rot, observe the following points:

(1) Air the coloring rooms thoroughly every six to eight hours, leaving them well opened for an hour. Fans should be used to circulate the air and blow it out. Leave three inch spaces between the rows of field boxes. A false floor with bottom heat or putting one empty field box at the bottom of each stack helps the air circulation.

(2) Do not greatly exceed the standard dosage of one cubic foot of ethylene gas to 5000 cubic feet of room space, to be given every six to eight hours after thoroughly airing the room, less than this amount will readily color the fruit if other conditions are right, in a room of average tightness. The dose may be reduced as color develops. A 15 gallon measuring tank holds 2 cubic feet and discharges this amount of ethylene when charged to 15 pounds pressure on the gauge. It discharges 1 cubic foot gas at 7½ pounds on the gauge, 3 cubic feet at 22½ pounds on the gauge and other amounts in like proportion. Figure the required dosage for room accurately for the size measuring tank used.

(3) Do not exceed 85° F. and have the heat throughout the room as nearly even as possible. While fruit may stand 90° F., it is risky and not good for the fruit. Humidity of about 85 percent is satisfactory.

(4) Handle fruit very carefully to avoid bruising with consequent liability to green spot and other forms of coloring room injury. Do not pick while wet.

(5) Do not attempt to color fruit that will require longer than 72 hours in the coloring rooms; 36 to 40 hours is a preferable maximum time.

(6) Fruit from groves badly infested with the stem end rot fungi should be allowed to color on the tree, at least to the point where not more than 36 hours is required for coloring. One day in a warm room advances stem end rot as much as one week at temperatures below 55° F. Unfortunately the warmth required for coloring gives the very best conditions for the development of stem end rot. Further progress of rot can be slowed but not prevented by promptly cooling the fruit. This should be done, and the fruit handled with least possible delay.

(7) Fruit from different groves reacts differently. As a precaution, run a few sample boxes through a regularly filled coloring room in advance of picking the crop to see whether it colors up promptly, is free from unusual liability to coloring room injury, and does not develop excessive stem end rot when held for a reasonable shipping period after leaving the coloring room.

(8) The worst damage comes from a combination of too little ventilation, too high temperature and too much gas. Don't suffocate and kill the fruit.

"BUG HOUSE" MAN GIVES INQUIRER DESIRED FACTS

So well known is the College of Agriculture of the University of Florida, and its branches, the Experiment Station and Agricultural Extension Division, that it has received and answered letters addressed in divers and sundry ways. A Lake County farmer provided the newest cognomen when he addressed a letter to the 'Bug House, Gainesville, Fla."

Although the Experiment Station has not yet gone "bug house," it got the letter, and its entomologist, or bug man, Mr. J. R. Watson, was able to supply the Lake County man with the information he wanted.

IMPRESSIONS

Continued from page 11

Lake, N. Y. We are glad indeed that reports of his condition are satisfactory. However, with Justice among the citrus casualties we find ourself with nowhere to go with our radio problems.

Lemonade was used first by the Chinese about the year 1,000 A. D.

For
White Fly
and
Sooty Mould
Clean your trees of White Fly and Sooty Mould with a thoro application of VOLCK. It will also clean up any scale that may have survived thru the summer.
Talk with your nearest dealer.
CALIFORNIA SPRAY CHEMICAL COMPANY
O. R. Blois, District Sales Mgr.
61 W. Jefferson St., Orlando, Fla.
VOLCK
The Scientific Insecticide

PAINTER'S

Simon Pure Citrus

and

Gem Farm Crop FERTILIZERS

ARE

"Time Tried and Crop Tested"

Our Brands are the Acknowledged Standard by which Growers of Florida have judged all Fertilizers for nearly 40 years.

"Giving all we can for what we get instead of getting all we can for what we give" is the policy of

THE E. O. PAINTER FERTILIZER CO.

Jacksonville, Florida

Grapefruit, Porto Rico

Grapefruit Growers of Porto Rico Suffer $10,000,000 Hurricane Loss

The hurricane which raked Porto Rico September 13 caused loss to the grapefruit industry of the Island estimated at $10,000,000. Very little of this was covered by insurance, according to R. Welch, clerk to Trade Commissioner at San Juan, in a report of September 18, 1928.

The losses are classified as follows: 1. All canning plants (eight) blown to the ground. (This included all pineapple canneries). 2. About 100,000 trees entirely destroyed. 3. All other trees entirely stripped of leaves and fruit, ruining prospects for the large harvest anticipated for January and February. No fruit in quantities is expected to be available for shipment before the midseason harvest, August-September, 1929. 4. Loss of homes, buildings, and personal effects of owners, managers and workmen.

The fruit industry of Porto Rico feels this damage particularly keenly since it was already suffering from the effects of a prolonged drought in the late spring which had cut down shipments during June, July and August and which made the midseason harvest, beginning about September 1 considerably below that of September, 1927.

The industry, however, probably will be able to reestablish itself without great difficulty. Fruit growers, it is true, had been turning their profits back into developments during recent years, and the loss therefore covers net earnings of several years. It is likewise true that little of the property damage was covered by insurance. Yet, most fruit growers were free of debt and without any great mortgages on their property from previous loans, and they will therefore probably experience no difficulty in borrowing money for renewals of equipment and replacement of trees.

As yet no steps have been taken to replace canning plants blown down. With no fruit available for canning, the industry feels that it is more important to repair the damage to the orchards first and reconstruct the canning plants afterwards. There are no figures available on the amount of canned grapefruit and pineapple that was in stock in the canning plant warehouses. This probably was not great. What little was on hand apparently is badly damaged, crates and boxes being crushed and blown away, labels soaked from the cans in heavy rains and the cans themselves demolished, crushed and scattered. Since the pineapple crop was about at an end for the season and the new crop of grapefruit was not large, there was not a great deal of activity at the canning factories at the time the storm struck.

No figures are available on the number of grapefruit trees which stood in the orchards of the Island prior to the storm. It is estimated, however, that the total was not less than 500,000. About 20 per cent of these were entirely destroyed, many being broken off about a foot above the ground and others having been entirely uprooted. This damage is probably greater than at first evident from the figures, considering the fact that practically all of the trees entirely damaged were the older full-bearing trees. Those with their large trunks could not bend in the 150-mile-an-hour gale and therefore either snapped in two or were pulled up by the roots. The trees which survived the best were the younger trees which bent over in the gale but which will undoubtedly become upright again.

Tanaka, Dr. Tyozaburo

JAPANESE SCIENTIST VISITING IN FLORIDA

Dr. Tyozaburo Tanaka, probably the world's greatest living specialist on citrus taxonomy and the classification of varieties, is visiting in Florida this week making a study of the citrus industry, with particular reference to varieties. While in Gainesville he made an address before the horticultural class in the College of Agriculture.

Dr. Tanaka is professor of horticulture at Taiwan Imperial University in Japan, also director of the Tanaka citrus experiment station and has been recently appointed by the Japanese government as director of the newly-established Formosa experiment station.

According to Dr. Tanaka, the Mediterranean varieties of citrus, which are grown extensively in Europe and America, originated from two Chinese varieties. Most of the citrus grown in Japan is Satsuma oranges.

FERTILIZERS

that produce money-making results bear the

A & G BRAND

Every year the demand for A.&G. Brand Fertilizers increases. Many of the largest co-operative agricultural organizations have standardized on the proven formulas bearing the A. & G. Brand. Any fertilizer is better than none —but tests over many years have shown that your fertilizer investment will make more money for you if you insist on A.&G. Fertilizers. Write for our price list No. 60. It contains scientific formulas for every fertilizer need — formulas worked out in our own laboratories and proven money-makers in actual use on hundreds of farms throughout the South. Write us today.

Patagonian Bird Guano carried in stock — also Genuine Peruvian Guano. Prices on request.

Atlantic & Gulf Fertilizer Co.

C. Nash Reid, President

Jacksonville, Florida

BRAND SUGGESTS DISPOSITION MUSCLE SHOALS

Continued from page 16

(during any period of government operation), shall be covered into the Treasury of the United States as miscellaneous receipts, but shall be earmarked "Muscle Shoals Income," and that funds for conducting the activities recommended herein, including the needs of the War Department for the operation of locks and other structures lating to the Wilson Dam, shall be estimated and budgeted annually in the manner that is customary with other appropriations for the support of the executive departments.

MARKED INCREASE IN AMERCAN DRIED FRUITS EXPORTS

Exports of dried fruits from the United States have more than doubled during the past few years, a trade bulletin just issued by the Commerce Department's Foodstuffs Division reveals. In 1927 foreign shipments of these products aggregated 240,894 tons as compared with 115,282 tons in 1922. During the first eight months of the current year our export trade in dried fruit was a third larger than for the corresponding period of 1927. Prunes and raisins are the most important items entering into this trade, accounting for about 85 per cent of the total exports.

The United Kingdom is the most important foreign outlet for American raisins while Germany leads in the consumption of American prunes besides taking the greatest proportion of our shipments of dried peaches, apples and apricots. About 90 per cent of the prunes and 30 per cent of the raisins sold in the British market are of American origin. The greatest demand for dried fruit in this area is during the Christmas season giving American products a decided advantage over Australian and South African fruits which are harvested six months earlier.

In Great Britain American raisins must meet the competition of fruit from Spain, Greece, Turkey, Australia and British South Africa. During the past few years however, the American raisin has been replacing the product of the first three countries. The chief competition met by American prunes comes from Yugoslavia.

Arsenate of lead does not lose its strength if left exposed to air.

PORTO RICAN PINEAPPLE CROP

In a report to the Department of Commerce, Rolland Welch, of the Office of the Trade Commissioner at San Juan, Porto Rico, states that steady rains within the last six weeks have greatly benefitted the Porto Rican pineapple crop, which is beginning to show recovery from the damage wrought by the storm of September 13.

Reports from all sections indicate that pineapples quickly respond to beneficial rains and it is apparent that the effects of the storm on the crop will be much less than previously expected in some quarters. The size of the harvest for next April, May and June will depend largely on weather conditions until then. The greatest danger is drouth, which, last Spring, cut off bright prospects materially reducing the size of the fruit.

However, it is indicated at present that the forthcoming harvest will not be ten per cent below estimates made before the storm.

Farmers of Wakulla County who were members of the five-acre corn contest made yields as high as 140 yield for the county.

Beautify Your Home Grounds

Visit us at Oneco, or write for free advisory service. Over 45 years experience is yours for the asking. Free catalog on request.

Reasoner Brothers'

ROYAL PALM NURSERIES

Oneco, Florida

Getting what our fruit is worth is just a question of

Making It Keep Better

"Fruit must stay sound in the hands of the dealer at least 5 days" is the opinion of the sales manager of a big marketing organization.

"Neither pre-cooling nor icing are enough because when taken from refrigeration the fruit sweats and blue mold starts."

"If a dealer takes a loss on Florida fruit he will turn to California fruit and our crop will be a total loss."

That others share the same view is attested to by the fact that within the last two years 22 houses have put in the Brogdex system which has cut their decay losses to almost nothing. Among these houses is the P. H. Varn house at Knights.

The splendid record of this house has convinced Mr. Varn that the Brogdex system is the solution to the decay problem and has awarded us contracts to equip his other houses with the same system.

A thoughtful consideration of this process and what it will accomplish will convince you too of its many advantages.

A representative will call or complete information will be sent you by mail.

Florida Brogdex Distributors, Inc.

B. C. Skinner, Pres. **Dunedin, Florida**

WINNERS OF SOIL IMPROVEMENT AWARDS TO COUNTY AGENTS NAMED

Six Southern county agricultural agents who have put into effect and are continuing an outstanding soil improvement program and who will be rewarded in February with a free trip to the annual meeting of the Association of Southern Agricultural Workers in Houston, Texas, have been named. These agents come from North Carolina, Alabama, Mississippi, Oklahoma, and Arkansas, and are being awarded the trips by the Southern Division, Soil Improvement Committee, The National Fertilizer Association.

First place was awarded to H. K. Sanders, Roxboro, Person county, North Carolina. The other five places are listed alphabetically, as no rankings were made of these five: W. L. Hall, Conway, Faulkner County, Arkansas; H. C. Heath, Lafayette, Chambers county, Alabama; C. L. McNeil, Canton, Madison county, Mississippi; Earl W. Smith, Muskogee, Muskogee county, Oklahoma; and W. G. Yeager, Salisbury, Rowan county, N. C.

"These awards were made to stimulate interest in soil improvement programs as recommended and approved by the various state experiment stations and agricultural extension services," according to J. C. Pridmore, director of the Soil Improvement Committee. "The six outstanding reports were selected by a committee of agricultural college workers in cooperation with the extension service officials who have charge of county agent work in the various states. Winners were selected on the basis of a uniform score card which took into consideration accomplished results in soil improvement in the county, methods of putting the programs into effect, and plans for future soil improvement efforts based on an analysis of the situation as it exists in the County."

The winning county agents will be given an opportunity of attending the Southern Agricultural Workers meeting and also the meeting of agricultural extension workers who will hold a jubilee convention commemorating the establishment of the first agricultural extension office in the country at Houston 25 years ago. A banquet will be given in honor of the agents and arrangements are being made for the broadcasting of talks based on their programs and accomplishments. Gold medal fobs will be awarded by the Soil Improvement Committee as permanent trophies of accomplishment, along with certificates that may become the property of the county represented by the winning agent.

Members of the judging committee were O. S. Fisher, extension agronomist, United States Department of Agriculture, Washington, D. S.; W. B. Mercier, director of extension, Louisiana State University, Baton Rouge; I. O. Schaub, dean of agriculture and director of extension in North Carolina State College, Raleigh; T. S. Buie, head of the department of agronomy, Clemson College, S. C.; and J. R. Ricks, director of the experiment station, A. and M. College, Mississippi.

Three thousand birds in Leon County are competing for honors in the fourth home egg-laying contest being conducted by the Agricultural Extension Division of the Florida College of Agriculture.

NECESSARY . . .

Potash pays because plants need potash. A complete fertilizer containing plenty of potash produces profitable yields, improves crop quality, and helps plants resist disease.

CHEAP . . .

Potash is as cheap today as before the war. The price of potash, per unit of plant food, is about 20% cheaper than the average price of the twelve leading fertilizer materials.

PLENTIFUL . . .

Fertilizer manufacturers carry large stocks of potash. If you have trouble getting potash, write or wire our nearest office and we will help you.

Agricultural and Scientific Bureau

N. V. POTASH EXPORT MY.

of Amsterdam, Holland

19 West 44th Street NEW YORK

Hurt Building ATLANTA

McCormick Bldg. CHICAGO

Lampton Bldg. JACKSON, MISS.

First Nat'l Bank Bldg. BALTIMORE

Bank of San Jose Bldg. SAN JOSE

NV

POTASH PAYS

FOREIGN MARKETS FOR FRUITS TO BE STUDIED

A study of existing and prospective European markets for American fruits, and arrangements for securing more frequent and more inclusive market and crop reports on fruits in Europe have been initiated by the Bureau of Agricultural Economics, United States Department of Agriculture.

Milton J. Newhouse, for four years manager of the North Pacific Prune Growers Exchange, has been given a special appointment by the bureau for a period of eight months to carry out the bureau's program. Mr. Newhouse will investigate the market problems of the various American cooperative associations which handle fruits in the markets of the United Kingdom, Germany, France, Belgium, Netherlands and Scandinavia. He will make a survey of present and future market potentialities, and market methods and practices.

The study will be extended to the fruit producing areas in southern Europe, particularly Yugoslavia, France, Italy and Spain, to determine the competition which the American cooperative associations, as well as other marketing agencies, may expect in the future. Mr. Newhouse will be abroad about six months, during which time he will endeavor also to arrange for more frequent and perhaps somewhat more inclusive market and crop reports as they pertain to fruits in Europe. The bureau's program has been arranged in response to the demands from cooperatives and other marketing agencies for foreign information on fruits.

MANY INSECTS ARE BENEFICIAL TO MAN

Insects may be helpful as well as harmful to man, and it is not always the wise thing to kill them at sight unless it is known that they are harmful, says J. R. Watson, entomologist of the Experiment Station.

For the past several months people have sent in specimens of a small insect for identification. It looks like a cross between a bagworm and a cloths moth. It makes for itself a flattened case covered with particles of sand and other dirt. The cases are about half an inch long and a quarter of an inch wide. From this case the insect puts out its head and front feet when it wishes to move about.

This insect seems to have no common name but goes under the scientific name of **Tineola uterella.** It belongs to the same family as clothes moths but instead of eating clothes, this insect feeds only on the remains of insects in spider webs. This insect is a friend of the housewife and should not be killed, Mr. Watson declares.

Spiders are useful insects because they destroy a large number of flies, mosquitoes, and other noxious insects. The chief objection, from the standpoint of the housewife, is the untidy looking webs in the corner of the ceiling, and other such places.

The habit of congregating on dead limbs of citrus trees to pupate causes many citrus growers to think that the Twice-Stabbed Ladybeetle is the cause for the dead limb. As a matter of fact this ladybeetle is a good friend of the grower as it eats large quantities of scale crawlers on the trees.

Many dairymen in Hillsboro County are planting mangels, sugar beets, and Belgain carrots for winter feeding. These are comparatively new crops for this county.

Fertilizer Materials

Bone Meal — Potash - Nitrate
Castor Pomace — Goat Manure

For Spot or Future Shipment

CHASE & COMPANY
SANFORD, FLORIDA

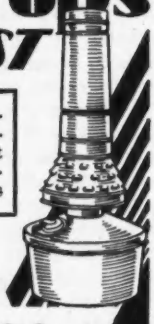
Manufacturers of CHACO Complete Fertilizers

All Market Crops
can be protected from danger of—FROST

PROTECT YOUR CROP with the time-tried and proven National "Scheu" Orchard Heaters, millions now in use by Fruit and Truck Growers—the only heater endorsed by any large group of fruit growers

Write for our 68-page book, "Frost Protection"—FREE

NATIONAL ORCHARD HEATER CO.
TOLEDO, OHIO
Florida Office: Haines City, Fla.
National Orchard Heaters are manufactured by the American Can Co.



HOTEL HILLSBORO

Tampa, Fla.

TOP O' THE TOWN

European Plan, Fireproof 300 Rooms With Baths

THE CENTER OF TAMPA

PLANT PEST CONTROL SUBJECT OF REPORT

Continued from page 7

Grande Valley of the Mexican fruit worm, a pest particularly of citrus fruit, but also of practically all other fruits. This effort is stated to have been completely successful and no reappearance or reestablishment of the pest has been noted in connection with the crop either of 1927 or 1928. By this effort, one of the most promising of the new citrus developments of the United States has been safeguarded and given a sound basis for future development.

The reorganization of the Board as the Plant Quarantine and Control Administration is in harmony with the present policy of the department to centralize regulatory functions in special units, thus minimizing interruptions in research activities. The reorganization will also "enable the Secretary, under the provision for interchange of appropriations, to meet emergencies arising from new or dangerous pests, such as the emeregncy just alluded to, occasioned by the spread of the Mexican fruit worm into Texas. Under the old system of appropriations for the Board, there was no possibility of such adjustments, except by action of Congress."

Other sections of the report deal with domestic quarantine on account of the Thurberia weevil, an important native enemy of cotton, various narcissus pests, and the date scale eradication effort, and notes the related domestic quarantines on account of the corn borer, the Japanese beetle, and the gipsy and brown-tail moths, enforced in cooperation with the Bureau of Entomology, and the quarantine on account of the white pine blister rust, enforced in cooperation with the Bureau of Plant Industry.

CUBAN GRAPEFRUIT EXPORTS

Exports of early grapefruit from the Isle of Pines, Cuba, amounted to about 102,000 boxes in the July to September, 1928, quarter, according to a report received in the Department of Commerce, prepared by Mr. John J. Coyle, American Vice-Consul, Isle of Pines, Cuba. These exports consisted of 54,000 boxes to England, 46,500 to the United States and small quantities to Canada, France, and Chile. It was anticipated that the early grapefruit crop would be all shipped out by October 15th and that exports by that date will amoupnt to 125,000 boxes. Isle of Pines grapefruit comes on the United States market from four to six weeks earlier than Florida grapefruit, thus obtaining the advantage of early prices.

SUGGESTIONS FOR REDUCING LOSSES FROM STEM-END ROT

Continued from page 10

moved from the coloring rooms to the floor for finished coloring.

Precooling aids materially in keeping stem-end rot in check after the fruit is packed and it should be utilized on all lots showing any appreciable amount of stem-end rot in the coloring process.

The fruit from some groves shows a greater tendency to develop stem-end rot than others. Before picking a grove that is not known, it will be advisable to make a preliminary test of a few boxes of fruit in the coloring room before a general picking is made. If the grove shows a large percentage of decay developing in the test boxes, have the fruit remain on the trees two or three weeks longer.

Mrs. Florence J. Albert began work as home demonstration agent in Hernando County November 19, with headquarters at Brooksville. Mrs. Albert was born in Kentucky and was educated at the School of Home Economics, at Columbus, Ohio.

Farmers of Walton County are planning to purchase cooperatively a solid carload of purebred cotton seed for next year.

ETHYLENE

Universally used by the citrus industry for coloring

Ripens, colors and blanches fruits and vegetables

Economical · Safe · Clean

For information write to

CARBIDE AND CARBON CHEMICALS CORPORATION

30 East 42nd Street, New York, N. Y.

Los Angeles San Francisco

Warehouses are located in all important centers in the United States

UCC

Unit of Union Carbide and Carbon Corporation

MOTTLE-LEAF, MARL CHLOROSIS AND NITROGEN STARVATION, THREE FORMS OF CHLOROSIS OF CITRUS TREES

Continued from page 5

surface. A number of observations in various groves on such calcareous subsoil, where sour orange rootstock was used, demonstrate that grapefruit trees, for some yet unexplained reason, thrive when orange and tangerine trees fail. This was so striking in a portion of one grove near Vero that the orange trees were were being topworked to grapefruit. Tangelo trees also often thrive on such soil types when orange and tangerine trees develop a characteristic chlorosis and decline. It is evident, however, that the nutrition of even the grapefruit and tangelo trees on marly subsoils is affected despite their tendency to thrive, for they both commonly develop a dull and inconspicuous form of chlorosis.

Cause

The cause of chlorosis in soils underlaid by marl or limestone appears to be due to the inability of the tree to get sufficient iron, an element absolutely essential to the formation of the chlorophyll, or green coloring matter, in leaves. According to the explanation given by Lipman in 1923, the presence of excess lime as calcium carbonate brings about an excess of alkalinity around the soil particles. Under such conditions, the iron of the soil is precipitated and the roots fail to get it.

Control

Aside from the use of fertilizers tending to increase soil acidity, the correction of chlorosis on soils high in calcium carbonate probably can be affected best by the applications of manure or bulky organic matter or by the planting of cover crops to keep up the processes of decay. The explanation of this influence, as pointed out by Reed and Haas in 1924, appears to be that the decay of organic matter has a solvent action upon the iron as well as producing carbon dioxide. This action probably brings iron into solution and thus enables the tree again to secure adequate quantities for the formation of the green pigment (chlorophyll) in the leaves subsequently formed.

The application of iron compounds to the soil, where chlorosis is related to high alkalinity, has not corrected this type of chlorosis in most cases. The precipitation of iron in soils of high alkaline reaction takes place so rapidly that it is usually not available to the tree. Spraying the chlorotic foliage with iron (ferrous) sulphate and manganese sulphate, in the experiments thus far carried out, appears to cause them to turn green only in certain small spots and has not proven effective permanently. The injection of solutions of iron sulphate into Citrus trees was reported by Lipman in 1925 to be a corrective for chlorosis induced by an excess of calcareous material.

Trees that do well on the coquina rock soils, which are so common on the middle east coast of Florida, so long as the soil is abundantly supplied with organic matter but the foliage turns pallid and becomes chlorotic as soon as the soil becomes depleted of its organic matter. Most soils contain an adequate supply of iron if the conditions are such as to render it available. The use of the proper amount of manure, bulky organic matter or cover crops helps not only to make the iron available but supplies nitrogen for making growth and for the correction of a different type of chlorosis due to nitrogen starvation, which is described in the following section.

The cutting of drainage ditches thru groves already established on Florida low hammock soils underlaid by marl has resulted in a mark-

FLORIDA ORANGE FESTIVAL - Winter Haven

List of Prize Awards

PRIZES FOR PACKING HOUSE EXHIBITS

Three handsome silver loving cups will be awarded as 1st, 2nd, and 3rd prizes for the best packing house exhibits from each of the thirty-two citrus producing counties in Florida. Judged on point scoring system. Score sheets may be obtained as a guide in preparing exhibits. Exhibitors restricted to the use of fruit from their own county only.

GRAND PRIZES

First prize winners in the county division will again be judged for grand prize awards. Cash prizes of $500 first, $250 second and $100 third will be awarded.

BY-PRODUCTS PRIZES

Awards of $50 first, $30 second and $20 third will be made for the best commercial displays of marketable canned or bottled citrus by-products, juices, preserves, extracts, oils, candies, etc.

PRIZES FOR INDIVIDUAL GROWERS

Awards of $200 and cup, First; $100 and cup, Second; and $50 and cup, Third; will be made to individual citrus growers making the best display of fruit from their own grove. Winners to be judged by point scoring system. Score sheets may be secured as guide to preparing exhibit.

FRUIT PACKING CONTEST

Two beautiful silver loving cups and three cash prizes: First $25, Second, $15, and Third, $10, are offered in a free-for-all fruit packing contest. Separate contests for both men and women.

SPECIAL PRIZES

Awards of $50 First, $30 Second, and $20 Third will be made for exhibits having the greatest educational value. Prizes in equal amounts are also offered for the best decorated booths.

Ribbons will be awarded winners in all classifications and in all divisions. Handsome silver loving cups and medals in gold, silver and bronze will be awarded the winners of all events in the Water Carnival, swimming, diving and boat racing contests, and many other features.

For Space Applications or Information, Address: FLORIDA ORANGE FESTIVAL, Winter Haven, Florida

"Please Say You Saw It In The Citrus Industry"

ed increase of chlorosis, apparently in consequence of lowering the water table, better aerating the soil and bringing the roots in more intimate contact with the marl, or possibly causing a greater concentration of the calcium carbonate in the soil about the roots. A study, reported by Burgess and Pholman in 1928, of chlorosis of Citrus trees on Arizona soils which were fairly high in calcium carbonate and alkaline in reaction demonstrated the value of adequate irrigation in correcting this trouble, whereas fertilizer experiments gave negative results.

Nitrogen Starvation

A form of chlorosis known as nitrogen starvation is of common occurrence in Florida Citrus groves.

Symptoms

This nutritional trouble manifests itself usually by a more or less uniform yellowing of the foliage which takes place gradually without the entire loss of chlorophyll. In the more acute cases the affected leaves bleach out yellow along the midribs and lateral veins and retain more or less of the normal green color in areas between the veins (fig. 3), thus exhibiting the opposite effect that occurs in the form of partial chlorosis known as mottle-leaf. In such cases the pronounced yellowing along the midrib contrasts very strongly with the balance of the leaf. In the course of time, however, the remaining green tissue of the leaves gradually turns yellow and eventually the entire leaf fades to an old-ivory color.

The foliage may exhibit nitrogen starvation from lack of fertilizer or crop strain alone, or it may occur in well fertilized trees as a result of some injury which so completely girdles a tree or part of a tree that the fertilizer can not be used by the affected part. In the former case the symptoms of starvation usually occur irregularly through the top of the tree, except in prolonged cases, and are more likely to occur in grapefruit and tangerine trees than in orange trees since they require more fertilizer than orange trees. In the latter case, the abnormal foliage may be confined to a single twig or branch, or it may be more or less general over the entire tree. Trees most commonly exhibit nitrogen starvation during the rainy period immediately following the summer rainy season, due to excessive leaching of nitrogen by the heavy rains.

Where not due to lack of fertilizer, the cause will be found to be due to the injury of some part of the tree which causes a partil girdling and prevents the conduction of nitrogenous materials to such an extent that the foliage dependent upon the functioning of the affected part may develop a starved appearance. It may be that merely a twig or branch has been partially girdled by breakage or other injury of the bark. In other cases, it may be that the entire top of the tree is more or less affected by partial girdling as a result of foot rot, psorosis or other bark injury. In still other cases, the starved appearance may result from the killing off of a considerable number of roots as a result of water injury or excessive root pruning done purposely for some reason or other.

Unlike foliage affected by mottleleaf and marl chlorosis, foliage that has become chlorotic as a result of nitrogen starvation may be restored to its normal green color by applications of some quick-acting source of nitrogen, in case the starved appearance results from lack of fertilizer alone, or, in case it was caused by an injury to some part of the tree, by grafting or inarching to bridge the girdled place. In case the ends of the roots have been killed by water injury, however, it will be necessary to wait until drainage conditions have been improved and new roots have developed.

EMULSO has kept more Florida Citrus trees clean during the past four years than any other oil spray

Why Florida Growers and Farmers *Prefer*

EMULSO THE BETTER SPRAY

Time and experience have proved that Emulso takes guess-work out of the spraying problem. Trees sprayed with Emulso now will next year be clean, healthy and productive. Farmers and Growers prefer Emulso because, like all Peninsular Insecticides, it is dependable. Just spray thoroughly and leave the rest to Emulso.

WRITE FOR PRICE LIST, CATALOG OF PENINSULAR DEPENDABLE INSECTICIDES AND INSECTICIDE FACTS. ALL FREE AND POSTPAID.

WAREHOUSES AT ORLANDO, WINTER GARDEN, SANFORD, FROSTPROOF, PLANT CITY, WINTER HAVEN, BRADENTON, FT. MYERS AND LAKE WALES.

PENINSULAR CHEMICAL CO.

TAMPA, FLORIDA

U. S. Bureau of Plant Industry

Research In Plant Industries Cover Wide Range of Interests

Continued progress in the investigation and improvement of plant production and allied industries is reflected in the annual report of the Bureau of Plant Industry of the United States Department of Agriculture which was made public to-day. The report submitted to the Secretary of Agriculture by Dr. W. A. Taylor, chief of the bureau, describes some of the most noteworthy achievements of the bureau during the last fiscal year. These have to do with fruits, fruit trees, grain, grasses, cotton, tobacco, vegetables, and forage; and drug, fiber, and other plants.

Disease, one of the limiting factors in economical plant production, is being successfully combatted in many instances through the use of varieties that are resistant or immune from the specific diseases in question. Resistant varieties are obtained sometimes through introduction from foreign countries, sometimes by selection, and more often by selection and breeding. Doctor Taylor reports progress in the development of wheat varieties resistant to rust, scab, and bunt diseases; oat varieties resistant to stem rust; corn resistant to root rot; tomatoes resistant to wilt and blight; strains of lettuce resistant to brown blight; and cucumbers resistant to mosiac.

Increased attention has been given the soy bean on account of the possibilities of the crop for oil and oil meal. About 1,500 new introductions were received during the year from Manchuria and other foreign countries. From these new varieties it is hoped to develop some that are of high oil content for use by oil mills, and others of low oil content to aid hog-feeding interests in the solution of the soft-pork problem.

The benefits of growing only one variety of cotton in a community, as advocated by the bureau, are gradually being recognized. Through this method it is possible to change the basis of production from the usual condition of mixed and mongrelized seed stocks to regular supplies of pure seed, so that all of the farmers of an organized community or district can produce fiber of the same character. One-variety communities are the best means of improving the entire output of cotton, and consequently higher prices can be expected because of the uniformity of the crop throughout the community.

The possibility of producing rubber in the United States is now receiving attention. The guayule plant, which grows wild in northern Mexicon and to a limited extent in western Texas, could be cultivated and grown in large quantities if remunerative prices were assured. Processes for extracting and refining guayule rubber have been applied extensively to the natural product in Mexico. Other species of native plants have been found to contain rubber and are being studied in the bureau to determine their cultural characters and requirements.

The promising new paper-mulch method of stimulating certain crops and incidentally controlling weeds has been investigated by the bureau during the year. It consists of the use of impervious black paper as a mulch. Tests during the last four years have demonstrated conclusively that various garden crops grown in the eastern United States are stimulated to greater growth by the paper mulch, and weeds are reduced to a minimum. A wide use of the paper mulch idea, however, appears to depend upon the development of paper that is inexpensive enough to permit

Insures BETTER CROPS AND IMPARTS UNEXCELLED CARRYING QUALITIES

An application of NitraPo at this time will greatly increase the size and yield of your crops — and because NitraPo contains the necessary nitrate of Potash to balance a feeding of nitrate of Soda, it will impart unexcelled carrying qualities.

NitraPo for citrus, and as a top dressing for field crops has proved, in thousands of tests, to be a material far superior to Nitrate of Soda and other Potash salts, being a natural combination of Ammonia and Potash—doubly refined.

Accept no substitutes alledged to be "just as good." NitraPo is doubly refined, snow-white in appearance and contains no acid or chlorine.

Now is the time to use NitraPo. Get a larger and better crop—ship quality fruit and truck that arrives on the market in fine condition—demanding top prices.

NITRATE AGENCIES COMPANY

NACO BRAND

1401-1405 LYNCH BUILDING

JACKSONVILLE FLORIDA

its use at a profit.

Numerous other topics of interest to a wide range of plant industries are discussed in the report. They include results of investigation and study on such subjects as perfumery plants, oil and drug plants, tobacco, sugar plants, nuts, bulbs and flowers, abaca, fiber flax, and hemp. A list of several hundred publications issued by bureau specialists is included in the report and serves to give a more comprehensive idea of the scope of the bureau's researches during the year.

WEST INDIAN GRAPEFRUIT

In a report to the Department of Commerce, Mr. Brice M. Mace, Jr., American Trade Commissioner, London, England, states that Prof. H. Clark Powell delivered a lecture in London on October 31, 1928, on "The Economic Position of Grapefruit and Its Influence on the West Indies." Prof. Powell recently investigated on behalf of the Empire Marketing Board, the possibilities of grapefruit cultivation in the West Indies and British Honduras.

While reporting that some of the islands of the West Indies did not possess conditions favorable to the production of grapefruit, Prof. Powell stated that he had found that a large area in Trinidad was highly adaptable to grapefruit cultivation, also that the interior of the Dominican Republic was one of the best places in the world for its production. British Honduras was also well suited to grapefruit cultivation; Prof. Powell saw two very fine orchards there.

Prof. Powell stated that much capital and good management would be necessary in order to make grapefruit cultivation successful and important in the countries mentioned, also that there were few orchards at present. Great care would be necessary for the orchards as well as in the picking, packing, and shipping of the grapefruit to market.

Prof. Powell stressed the fact that the countries mentioned had possibilities as sources of competition in foreign markets for Florida grapefruit. However, he emphasized careful grading of grapefruit and skilled management as necessary factors in such competition.

The story of how Mrs. R. Puddicombe, a home demonstration club member in Hillsboro County, made a dime grow to $77.54 is told in the August number of The Forecast, a national food magazine, by Hope McBryde of that county.

Don't Gamble with your CITRUS

YOU can decide right now to have a good crop of fruit next year. Simply put your trees in good condition. Give them a chance . . . and they'll set a large, early crop.

Feed them Chilean Nitrate of Soda now—from 3 to 5 lbs. per tree, to hasten new growth and get them ready to bloom. If your groves suffered from storms it is all the more important to give them the nitrogen tonic they need. Then feed Chilean Nitrate again in early Spring and early Summer.

A successful grower says:

"The results from Chilean Nitrate were fine. The trees that had it set a great deal more fruit than those that did not have it. I intend to use Chilean Nitrate on our entire grove next year." *G. W. Smith, Winter Garden, Fla.*

Chilean Nitrate is the food that makes fruit trees thrive. It is the original, natural nitrogen fertilizer. It is immediately available. Its good work starts at once. Not only on citrus and other fruit, but vegetables of all kinds. Works wonders on cotton and corn.

Free—Fertilizer Book

Our new 44-page book, "How to Use Chilean Nitrate of Soda" tells about citrus and all other crops. It is free. Ask for Book No. 1 or tear out this ad and mail it with your name and address written on the margin.

Chilean Nitrate of Soda

EDUCATIONAL BUREAU

for Profitable Crops

Orlando Bank & Trust Bldg.
Orlando, Florida

In writing please refer to ad No. D-25

CITRUS COMMENTS

Continued from page 9

the rainy period. But it is equally true that we usually neglect to build up a nitrogen reserve quickly after the summer rains. Every winter, any of us can find groves suffering from lack of nitrogen first, and dry weather, second.

It is very surprising how well groves in good vegetative and fruiting conditions previous to continuously dry weather will come through such a trying ordeal. It is equally as surprising to note the increased cold resistance the trees will have under low temperature, if they are of good color and well balanced for growth and fruitfulness. We try very hard and spend money to supply available materials. That is, materials the plant can use quickly and easily. Nearly one-half of grove operating cost is represented in their purchase. We do not seem to try anything like as hard as we should to supply materials in the right quantity and availability during the winter. Its lack is so often directly reflected in poor tree color, smaller fruit size than necessary, and what is more important, lack of a good bloom and a good fruit set the following spring.

Disease Resistance

Well colored trees (good healthy green) withstand insect and disease attacks better than trees that are off-condition from any cause. Of the two conditions commonly met of over-forced and under-fed, we find more groves severely attacked and more fruit russeted in the under-fed properties.

It is a very common thing during the winter to find groves severely infested with rust-mites where such groves have faded out from a good healthy green to a pale nitrogen-starvation color that is all too common. Later in the winter, these same groves are subject to severe infestations of red-spider and six-spotted mites and also they are nothing like as resistant to long scale, purple scale or Florida red and chaf scale, which can always be found scattered over the bark of trunk and larger limbs in abundant masses. Fertilizer will not entirely prevent such infestations, but we are coming more and more to the point of view that its judicious use on a yearly balance basis will cover a multitude of defects and get the grove through the year in a more successful and cheaper manner. Fertilizer is not a cure-all, but it is a very successful crutch.

Objections to Heavy Fall Fertilizing

Over-stimulation with available ni-

Low markets only emphasize that healthy trees and bright fruit are profit-insurance to the growers--

Fumigate
Once a Year

Write for booklet 32
"Florida Fumigation Facts"

American Cyanamid Sales Co., Inc.
1235 North Orange Avenue
Orlando

trate produces a coarse, undesirable non-bearing type of growth.

Remedy that Works: Balance with phosphorus and potash forms of plant foods.

Any nitrate applied in the fall disturbs the fruit quality and fruit holding ability of the tree.

Remedy: There is no definite remedy except that highly available phosphorus and potash forms of plant foods tend to hold down to a minimum any harmful disturbances, and in many cases, highly improve fruit quality and holding ability. The grove itself would decide the safety of the application in such cases. It is rarely dangerous to the fruit crop of the tree.

Summary

From the actual grove effect so easily seen in the field and from the final results secured in the grove months later which can be so easily followed by anyone, there seems to be much more to gain by heavy fall fertilizing than by lighter applications at that time. With heavy crops, heavier feeding seems even more necessary. While there are some disadvantages, they seem to be outweighed by actual results secured in the heavier fall applications.

SPRAY YOUNG TREES KEEP RABBITS AWAY

One and a half ounces of lead arsenate and one ounce of linseed oil mixed with one quart of water makes a spray solution that will keep rabbits off of young citrus trees. This remedy was discovered by Dr. E. W. Berger, entomologist of the State Plant Board.

This mixture not only keeps rabbits from eating the bark of the young trees but also kills orange dogs, grasshoppers and other enemies of tender young foliage. This preparation does not hurt the trees.

For putting on this mixture an atomizer is recommended, as a spray tank uses too much liquid. Atomizers such as are used for spraying flies about the house will do the work effectively, it is stated by Dr. Berger.

In making this spray, the lead arsenate should be mixed in the water and then the linseed oil added. This remedy has been tried out by Professor J. R. Watson of the Experiment Station and he is recommending it.

Recent additions to his herd have brought the number of registered Jerseys owned by John Williams of Marion County up to five. He is now raising a calf from his first club calf.

Preparedness--

A season of large plantings and big demand for good nursery stock found us prepared to take care of an unusual demand.

We are still in a position to make prompt delivery of a very considerable number of excellent trees for winter and spring plantings. A fine selection of approved varieties.

Also we still continue our practice of selling at a discount trees on other than sour orange rootstock, our specialty for twenty-five years being the best sour rootstocks.

Drive out here (three miles east of Leesburg on the main Tavares-Eustis highway) and inspect for yourself. You will likely be pleasantly surprised at the available selection of excellent trees of various sizes we can furnish at truly reasonable prices.

Lake Nursery Company

Leesburg, Florida

CLUB WINNERS AWARDED FREE TRIPS TO CHICAGO

Mildred Gunson, Roberta Sheppard, Quinnelle Fuller, and Kathleen Reese are representing the 4-H club girls of Florida at the International Club Congress, which opened in Chicago November 30 and lasts for a week. They were accompanied by Miss Mary Stennis, nutrition specialist of the state home demonstration department.

Miss Gunson won her trip by placing first in a state-wide contest to decide the most outstanding club girl in the state. She is from Havana, and was given the trip by Montgomery Ward and Company.

Miss Sheppard won her trip during the South Florida Fair, held last January. She scored highest of any club girl exhibiting products at the fair and was given the trip by the fair association. Her home is in Lake County.

Miss Fuller will represent Florida club girls in the national health contest as the healthiest girl in the state. Miss Fuller lives in Columbia County, and her trip is financed by the State Department of Agriculture.

Miss Reese is the winner of the contest to determine the club girl making the most physical improvement as a result of nutrition work during the year. She lives in Hillsboro County and received the trip through the courtesy of the Southern Cotton Oil Company.

BRAZILIAN ORANGE EXPORTS

In a report published by the Department of Commerce, Mr. Fred E. Huhlein, American Vice-Consul, Rio de Janeiro, Brazil, states that while in the past Brazilian orange exports have been confined largely to Argentina and Uraguay, shipments to European countries are showing an increase.

Dairymen of Flagler and Volusia counties are taking steps to reduce their cost of production by growing more pastures and forage crops.

CLASSIFIED Advertisments

The rate for advertisements of this nature is only five cents per word for each insertion. You may count the number of words you have, multiply it by five, and you will have the cost of the advertisement for one insertion Multiply this by the total number of insertions desired and you will have the total cost. This rate is so low that we cannot charge classified accounts, and would, therefore, appreciate a remittance with order. No advertisement accepted for less than 50 cents.

REAL ESTATE

WILL EXCHANGE West Texas cattle ranch for unimproved or improved land in Florida. What have you? Give price and full particulars. T. E. Bartlett, 3410 McKinley Ave., El Paso, Texas.

"BOOK OF TRUTH"
For planters of new groves
Is yours for the asking,
Write Today.
OCKLAWAHA NURSERIES INC.
"Pedigreed Citrus Trees"
Lake Jem, Florida

FOR SALE—Pineapple land in winterless Florida $15 an acre. Almont Ake Venus, Fla

WANT TO SELL HALF INTEREST IN FIFTEEN ACRE SATSUMA BEARING GROVE ON HIGHWAY NEAR PANAMA CITY, ROBT. LAMBERT, OWNER. FOUNTAIN, FLA.

SATSUMA BUDWOOD from Bearing Trees. Hills Fruit Farm, Panama City, Fla.

WANT TO hear from owner having farm for sale; give particulars and lowest price. John J. Black, Box 93, Chippewa Falls, Wisconsin.

MISCELLANEOUS

RUNNER peanuts—Spanish peanuts Early speckled - Osceola - White Chinese and Bunch Velvet Beans. All varieties peas and Soybeans. Large or small lots. H. M. Franklin, Tennille, Georgia.

HIGH BLOOD PRESSURE easily, inexpensively overcome, without drugs. Send address. Dr. J. B. Stokes, Mohawk, Fla.

WANTED

COMPLETE LINE OF CITRUS GROWERS' SUPPLIES

A well known reputable firm of national scope, marketing certain materials required by citrus growers, is extending its line of merchandise to cover complete requirements of its customers.

If you have something excellent to merchandise—fertilizer, orchard heaters, pest control material or equipment, or any similar product for wide distribution—I can tell you whom you should see.

Address: J. T. Pierson, 503 South Union Drive, Los Angeles, Calif.

WHITE WYANDOTT Cockrels, regal strain—the best in the country, direct from Martin pens. Utility and show birds $5.00 each; also eggs for hatching $5.00 per 15. W. A. King, Gen. Del., St. Petersburg, Fla.

BEGGARWEED SEED. Place your order for Beggarweed seed now and be assured of delivery. Write for special prices. Wm. G. Ranney, Box 297, Monticello, Fla.

PUREBRED PULLETS FOR SALE—White Leghorns and Anconas ready to ship. Barred Rocks and R. I. Reds shortly. Several hundred yearling White Leghorn hens now laying 70%. Write or wire for prices. C. A. Norman, Dr. 1440, Knoxville, Tenn.

LAREDO SOY BEANS, considered free from nematode, excellent for hay and soil improvement. Write the Baldwin County Seed Growers Association, Loxley, Alabama, for prices.

FARMER AGENTS: Make $25.00 weekly selling Comet Sprayers. Profitable winter employment. You take orders. We deliver and collect. Commissions weekly. Established 35 years. Particulars free. Rusler Co., Box C-18, Johnstown, Ohio.

FOR SALE—All varieties bananas and citrus trees. D. A. Nigels, Palm Harbor, Fla.

FOR SALE—Dairy and stable manure, car lots Link & Ragley Box 464. Tampa Fla

AVOCADOS - SEED — Grafted. Reliable bearers only. John B.Beach, West Palm Beach, Florida.

BABY CHICKS: Send no money, shipped C. O. D., pay mail man when delivered. Leghorns $14.00 per 100; reds, orpingtons, minoreas $16.00; mixed $13.00; live delivery, postpaid. Florida Baby Chickery, Lakeland, Florida.

ROUGH LEMON Seedlings in any quantity, special summer sale, very attractive prices. A. E. Nichols, Box 262W, Tampa, Fla.

FOR SALE—Complete unit citrus packing house machinery, Skinner washer and polisher Stebler sizer two car capacity. G. A. Robinson, Lake Wales, Fla.

WANTED—Position on farm or grove. Go any where, or do any honest work. W. B. Shaw, Bradley Junction, Fla.

WANTED—To hear from owner of land for sale. O. Hawley, Baldwin, Wis

Orders-Inquiries
60 pages
Send for FREE copy
Can be Secured by MAIL
POLK'S REFERENCE BOOK
and Mailing List Catalog
Gives counts and prices on over 8,000 different lines of business. No matter what your business, in this book you will find the number of your prospective customers listed.
Valuable information is also given as to how you can use the mails to secure orders and inquiries for your products or services.
Write for Your FREE Copy
R. L. POLK & CO., Detroit, Mich.
Largest City Directory Publishers in the World
Mailing List Compilers—Business Statistics
Producers of Direct Mail Advertising

Statement of the Ownership, Management, Circulation, Etc., Required by the Act of August 24, 1912, of The Citrus Industry, Published monthly at Tampa, Florida, for October 1, 1928.

State of Florida,
County of Hillsborough.

Before me, a Notary Public, in and for the state and county aforesaid, personally appeared S. L. Frisbie, who, having been duly sworn according to law, deposes and says that he is the manager of The Citrus Industry and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act, of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse side of this form, to-wit:

1—That the names and addresses of the publisher, editor, managing editor and business manager are:

Editor, S. L. Frisbie, Tampa, Fla.
Business Manager, S. L. Frisbie, Tampa, Fla.

2—That the owners are:

S. L. Frisbie, Tampa, Fla.
S. Lloyd Frisbie, Tampa, Fla.
B. L. Gable, Asheville, N. C.
F. L. Skelly, Orlando, Fla.
Frank Kay Anderson, Altamonte Springs, Fla.
B. W. Skinner, Dunedin, Fla.
F. P. Wall, Mansfield, Ohio.

3—That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgagees or other securities, are:

Mergenthaler Linotype Co., Brooklyn, N. Y.
Bankers Mortgage Co., Orlando, Fla.

S. L. FRISBIE, Manager.

Sworn to and subscribed before me this 5th day of October, 1928.

W. D. STONE,
Notary Public.

4773-18
25-
FREE PUBLIC LIBRARY
JACKSONVILLE, FLORIDA